MARCH 10, 1924

THE RUBBER AGE

VOL. XIV. NO. 11

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THE RUBBER AGE

The Only Twice-a-Month Rubber Publication

VOL. XIV. MARCH 10, 1924 No. 11

PRODUCTION INCREASED IN NEARLY ALL LINES

Reports from Rubber Centers Indicate that Production is on the Increase—Tire Production in Akron and Trenton Shows Healthy Condition — Footwear Industry Improved

Production in nearly all tire factories is at a peak, according to recent advices from the various rubber centers. The months of January, February and March usually witness big production schedules and this year is proving no exception. The tire industry started the year with an inventory of about six and a half million tires, a stock which did not indicate a prosperous winter, but this stock has been reduced considerably until today it is doubted if there are more than 4,000,000 tires on hand.

Factories in Akron and Trenton are working three shifts and there are few tire workers walking the streets. It is unlikely that production schedules will be increased much above those now in effect for practically the full capacity of the plants are being utilized. It is said that Goodyear is making 31,000 tires a day now, an increase of several thousand over January. Balloon tires, of course, are causing a lot of discussion in the trade but this tire has not made itself felt to any appreciable extent in the daily production despite the extensive advertising and publicity which it has received. It is felt in some quarters that balloon tires should have been kept off the market until the end of the present buying season with the chances that by that time more real interest on the part of the tire-buying public would have been aroused.

Firestone, of course, is making more balloon tires than any other tire manufacturer and this plant is planning on increasing its production in this line quite appreciably this year. Mr. Firestone has said that the balloon tire is the tire of the future and there is little doubt in the minds of old tire men that this is so. It behooves the industry to sell the principle of these low pressure tires more thoroughly, however, before they can be generally adopted. On a whole the tire business is satisfactory and prospects are very good for 1924.

MONTGOMERY CLAIMS BOSTON RUBBER SHOW IS UNAUTHORIZED

Mr. H. Greville Montgomery, Director General of the Sixth International Exhibition of Rubber disclaims any connection with or authority for the title of "The Seventh International Rubber Exhibition" for the proposed Boston rubber exhibition.

In a letter to THE RUBBER AGE, Mr. Montgomery declares that such a title is an infringement of the rights held by the "International and Allied Trades Exhibition, Ltd." The complete letter follows:

Editor, THE RUBBER AGE:

I am informed that a Rubber Exhibition is to be held in Boston next year, and I should be obliged if you would give prominence to the fact that this Exhibition has no connection whatever with those which have been under the control of "The International & Allied Trades Exhibition, Ltd." since 1908, organized by the late Mr. Staines Manders, and since his death, by myself.

No authority has been given for describing the Boston Exhibition as "The Seventh International Rubber Exhibition" and the same is a deliberate infringement of my title. The time and place of holding the 7th International Rubber Exhibition will be announced in due course.

Footwear Industry Looks Up

The stormy weather and bad footing of the last several weeks has done much to increase sales of rubbers and other rubber footwear in New England generally. Although the results of the increased consumer buying of this merchandise have as yet not been very apparent in the duplicate business placed, this activity has done much to take many retailers out of the pessimistic frame of mind they have been in during the last few months. It has released a good deal of money tied up in slow-moving stocks, and this is expected sooner or later to result in material improvement in sales and collections. In the greater call reported by retailers, a feature has been the picking up in the demand for women's arctics, or galoshes.

EXCEL PLANT BOUGHT BY STUDEBAKER-WULFF

The Studebaker-Wulff Rubber Company of Marion, Ohio, takes over Plant and Property of the Defunct Excel Rubber Company of Wadsworth, Ohio

Frank L. Lytle, Receiver for The Excel Rubber Company of Wadsworth, Ohio, transferred on February 11, all the property and assets of the defunct company to The Studebaker-Wulff Rubber Company of Marion, Ohio, for a consideration of $92,000.

The Excel Rubber Company was incorporated in 1919. The factory was erected and completely ready for operation by July, 1920. It is a two-story, brick and mill construction, containing about 30,000 sq. ft. floor space. It is completely equipped with up-to-date machinery for the manufacture of automobile tires, inner tubes and trouser belts. Its appraised value was $340,000.00.

Although the plant is fully equipped to manufacture automobile tires, inner tubes and trouser belts, Mr. Lytle, the receiver, has continuously operated the plant producing trouser belts only. Under Mr. Lytle's management, he has succeeded in paying all expenses and earning a fair profit even though the plant was operated at a small percentage of its rated capacity.

In the purchase of the property by The Studebaker-Wulff Rubber Company they were in full cooperation with the bondholders and Creditors Committee. All stockholders, bondholders and creditors were given full opportunity to participate with The Studebaker-Wulff Rubber Company in the purchase and those who chose to do so were enabled to fully protect their investment.

Of $45,000.00 of bonds outstanding, there was only about $2800.00 represented by bondholders, who failed to cooperate in the purchase.

The Studebaker-Wulff Rubber Company is an organization of men who have had long experience in the automobile and tire industry. P. E. Studebaker, President, is the son of Henry, the eldest of the famous Studebaker Brothers of South Bend, Indiana, B. F. Wulff, Vice President & General Manager, has been in the rubber industry

(Continued on Page 410)

FOLLEN SEEKS TIRE TAX ELIMINATION

In an endeavor to help remove the existing tax of 5 per cent on tires and accessories, Mr. Thomas Follen, President of the Lion Tire and Rubber Corp., and President of the Mid-West Rubber Manufacturers' Association, recently sent the following telegram to John T. Casey of the Ways and Means Committee in Washington:

"We earnestly appeal to your honorable Committee to support removal to tax on tires and accessories. Every tire factory in our Association are in dire straights financially. The tax was a war measure which we all loyally supported. Tires and accessories are elements of transportation. Now that we sorely need assistance the removal of tax would be a Godsend to the struggling industries who deserve every assistance and encouragement."

Chemical Meeting in Washington

Plans are now being completed for the Spring Meeting of the American Chemical Society which will be held with the Washington Section at Washington, D. C., Monday, April 21, to Saturday, April 26, inclusive. All Divisions and Sections, are planning meetings. The local committees have nearly completed their arrangements. At least fifteen hundred members are expected.

The Rubber Division, in addition to their regular technical program, will have a Division dinner-smoker on Thursday evening, April 24, and special entertainment, with R. P. Dinsmore as chairman of the entertainment committee.

Gibbs Patents Golf Chart

A patent was recently issued (No. 1,484,390) to E. D. Gibbs and T. E. Wiederseim for an instruction chart for playing golf. Mr. Gibbs was Director of Advertising for the Goodrich Company and is well known in the rubber industry. The chart consists of a base on which the user stands. On this base there appears instructions for determining the correct stance of the players and for indicating the correct position of the golf ball with respect to the player's stance.

Trenton Dealer Association Formed

Articles of incorporation were recently filed by the Trenton Tire Dealers' association, with offices at 107 South Warren street. The association is to encourage and protect the trade, afford mutual protection to members and the public and develop the tire business on proper lines.

Eight trustees named include Joseph S. Papier, Roger O'Brien, Ralph W. Hackett, Ulric DeBlois, I. Richmond, Harry L. Raube and Herman Fineberg.

HOUSE CUTS TIRE TAX

Preliminary to action by the Senate, the House unanimously passed the tax reduction bill on tires and accessories on February 27, thus reducing the excise tax from 5 to 2 1-2 per cent. This reduction will mean a saving of about $24,000,000 a year. It is confidently expected that nothing will occur in the Senate to prevent its final adoption early in March. Included in the number of bodies who have diligently worked for this reduction are the Rubber Association of America, the M.A.M.A. and N.A.C.C. It is hoped to have a more detailed story in these columns in our next issue.

Northern Rubber Elects

At the recent annual meeting of the Northern Rubber Co., Akron, Ohio the following officers were elected: L. J. Schott, President; P. H. Snyder, Vice-President and Treasurer; Owen Moynihan, Secretary.

The Northern Rubber Co. last year purchased the plant of the former Biltwell Tire and Rubber Co. Improvements were made, and new machinery installed.

President Schott reports that the company is increasing its operations, and is starting production of balloon tires. Prospects are bright for a large sales volume this year, according to officers.

Directors of the company include Frank W. Siffert, Stanley M. Baltzly, A. Z. Wheeler, Louis Schott, Sr., and F. M. Howard.

Goodrich Reduces Balloons

A price reduction, effective February 15, was made by the B. F. Goodrich Rubber Co., on balloon tires. This decrease was not made on balloon-type tires. Prices now are on a par with the new Firestone prices. At this writing no other price decreases have been announced.

Explains Use of Antimony

Lynde D. Hokerk, Vice-president and General Manager of the Richo Manufacturing Company, Utica, N. Y., recently explained to members of the Utica Rotary Club how antimony sulphurets is used to increase the elasticity and tensile strength of inner tubes. Mr. Hokerk passed around samples of crude and vulcanized gum and explained in an interesting talk the whole process of tube manufacture and in a general way commented on the crude rubber situation. The manufacture of sulphurets was also explained so that his hearers were able to appreciate the complexities and ramifications of rubber manufacturing processes.

F. C. SNYDER ELECTED TO HEAD AMERICAN RUBBER

Floyd C. Snyder, former vice-president and general manager of the American Rubber & Tire Co., has been elected president to succeed former President F. H. Snyder, who died recently. The elevation of F. C. Snyder took place at the annual meeting of the board of directors. Mr. Snyder will also assume the duties of treasurer and remains general manager of the company

J. T. Johnson, vice-president and assistant general manager, and C. W. Herig, secretary and assistant treasurer, were reelected by the board. Two new directors were named. These are: Leo G. Snyder of Massillon, O., and George M. Smith, of Akron.

Rainbow Tire Elects Officers

At a recent annual meeting of stockholders of the Rainbow Tire & Rubber Co. of Delaware, Ohio, held in Columbus, additional capital was subscribed so as to complete the plant and obtain necessary equipment. The following officers and directors were elected: President, C. E. Ross, of Columbus; vice president, John Schaaf, of Delaware; secretary, M. J. Bergin, of Columbus; treasurer, C. A. Morrison, of Delaware. They will also serve as directors. Other directors named were: H. W. Volker, of Columbus; F. A. Willis, of Delaware, and C. R. Dill of Greveport.

This company will manufacture a number of articles of rubber in addition to a complete line of tires. Offices in Columbus are at 187 South High Street.

Excel Plant Sold

(Continued from Page 409)

for the past twenty years connected with the United States Rubber Company and the Kelly-Springfield Tire Company. H. C. Buchanan, Vice-President and General Superintendent, was formerly production superintendent of the Kelly-Springfield Tire Company, Akron, Ohio. They have associated with them many of the leading business men of Marion and Columbus, Ohio.

The Studebaker-Wulff Rubber Company was organized in Ohio about three years ago. They first bought the plant and property of the Marion Tire and Rubber Company of Marion, Ohio, and their business has increased so rapidly that they have gradually added to their capacity until they now have four complete factories, two at Marion, Ohio, one at Carey, Ohio, and the fourth the former Excel Rubber Company of Wadsworth, Ohio.

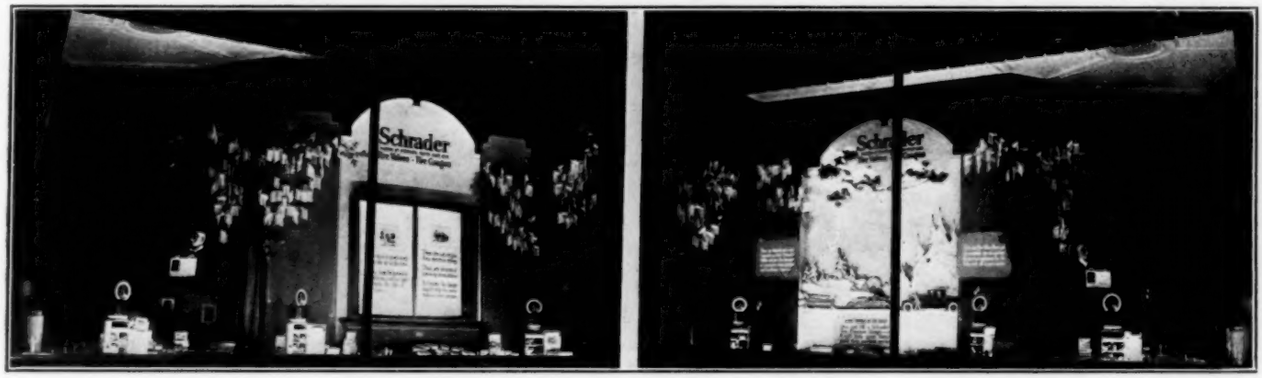
They sell direct to over two thousand dealers located within a radius of 500 miles from Marion and in 1923 their sales amounted to over a million dollars with only two plants then in operation. With the added capacity of the Carey and Wadsworth plants, they should be able to do a business of about two million dollars during 1924. The Marion plants are now operating night and day producing tires and they will begin to manufacture tires at Wadsworth at once.

NEW SCHRADER DISPLAYS ATTRACT GREAT ATTENTION

Two of the most attractive and informative window displays seen recently are those in the show windows of the Brooklyn plant of A. Schrader's Son, Inc., makers of Schrader Tire Valves and Tire Gauges.

In these windows every passer-by reads a complete story about proper tire inflation and its maintenance. In one window a large cut-out in colors shows a beautiful winter scene. Two automobiles are in the foreground, one of them at a standstill because of tire trouble.

In display type motorists are urged to use the complete Schrader Tire Valve and a Schrader Tire Gauge to help maintain proper air pressures and get maximum service from their tires.



Two Window Displays Recently Installed in Brooklyn by Schrader

In the apex of the window a comical mechanical wax clown very cleverly lifts a series of sixteen signs, one at a time, each of which carries a slogan regarding some one of the various Schrader products. This wax figure is astonishingly lifelike in its actions and attracts unusual attention.

In the other window the correct inflation story is told by pictures and text in a huge book, whose 12 pages, each 24 by 40 inches, are turned mechanically every few seconds.

These displays form backgrounds for effective groupings of Schrader Silent Salesmen, Tire Gauges, Tire Valves, Valve Parts and Valve Accessories, and will be a tremendous aid in spreading the important story of correct tire inflation and how to maintain it. They have an added advantage in that they are at the intersection of Atlantic and Vanderbilt Avenues, one of the busiest corners in Brooklyn.

Elections of Akron Divisions of A.C.S.

At the recent first anniversary meeting of the Akron Section of the American Chemical Society the following officers were elected for the ensuing year: Chairman, N. A. Shepard, of the Firestone Tire & Rubber Company; Vice Chairman, A. M. Hamblet, of The Goodyear Tire & Rubber Company; Secretary and Treasurer, W. J. Kelly, of The Goodyear Tire & Rubber Company; Councilors, W. W. Evans, of The B. F. Goodrich Company, R. P. Dinsmore, of The Goodyear Tire & Rubber Company.

The following committees were appointed: Membership, H. L. Fisher, V. S. Culp, R. H. Schmidt, W. J. Kelly; Social, W. Scott, C. W. Bedford, H. E. Simmons; Publicity, F. W. Stavely, R. B. Stringfield, H. R. Theis, and W. H. Juve.

Dow Plant Explosion

One man was killed, two injured and the plant building of the Dow Chemical Works at Midland, Mich., was partly wrecked recently by the explosion of a carbon tetrachloride still.

The injured men were burned when boiling sulphur chloride liquid was flung upon them while they worked 30 feet from the still. The explosion ripped away one end of the plant, a two-story frame structure, sheeted with iron.

Balloon Tire Pressure Gauge

For many years Schrader has been making straight and angle-foot gauges for testing regular tire pressures. When the first announcement was made regarding the possible production of "Balloon" tires, Schrader engineers began the development of a gauge that would register low pressures in one-pound graduations.

This low pressure Balloon Tire Gauge is the successful result of these experiments. In appearance it resembles the regular No. 2789 Schrader Angle-Foot Gauge. It is fitted with the angle foot which makes possible its use with disc and wire wheels and wheels with thick spokes or large brake drums. It is manufactured by A. Schrader's Son, Inc., Brooklyn.

New Schrader Angle Gauge Especially Designed For Low Pressure Balloon Tires

RUBBER ASSOCIATION ACTIVITIES IN FEBRUARY

In the February 25 issue of THE RUBBER AGE a review appeared as to the recommendations of the Tire Executive Committee on balloon and balloon-type tire sizes, inflation pressures, etc. A suggestion that balloon tires be *excepted* from the terms of the Standard Tire Warranty was not approved by the committee. The Committee is of the opinion that there is no good reason for not having the Warranty cover balloon tires as well as others. Balloon tires are embraced by the warranty at present because it refers to "*Every* pneumatic automobile tire", and the Committee concluded to make no change in this situation.

* * *

The Specification Committee of the Mechanical Rubber Goods Manufacturers Division held its annual meeting at the Yale Club, New York City, on January 31st. Mr. W. W. Evans (The B. F. Goodrich Company) and Mr. E. H. Grafton (Quaker City Rubber Company), were elected to serve as Chairman and Vice-Chairman, respectively, for the year 1924. Consideration was given to a number of specifications of the Federal Government and of the railroads covering various mechanical rubber goods products.

On February 1st, the Specification Committee met with a sub-committee representing Committee D-11 of the American Society for Testing Materials, and jointly considered specifications of the A.S.T.M. covering certain mechanical rubber goods items.

* * *

Satisfactory progress has been made in assembling the exhibit which will be made by the Rubber Association at the International Rubber Exposition to be held in Brussels next April. The exhibition will be chiefly of a statistical character, although there will also be shown balopticon views of the plants of Association members. Samples of products of the American rubber industry will also be exhibited, but their nature will be such as to preclude their identification as the product of any particular member.

KELLY 1923 LOSS DUE TO PRICE REDUCTIONS

The annual report for the year 1923 of the Kelly-Springfield Tire Company shows gross revenues from sale of $9,559,804, operating expenses of $8,797,397 and net before charges of $1,107,536 and a net loss after all charges of $1,166,284.

Deduction for interest on the company's ten-year 8 per cent sinking fund gold notes was $770,000, and other deductions, including depreciation, totaled $1,503,821.

The balance sheet as of Dec. 31 showed total assets of $38,033,817. Current assets were $15,306,141, and current liabilities $4,296,890. Surplus was $7,041,745.

A. L. Scheuer, President, said: "The first six months of 1923 showed a substantial profit, but owing to drastic price cutting during the second half of the year the operations for the entire year resulted in a net loss. During the year 1923 the company sold the largest number of tires and tubes in its history. The business outlook for 1924 is encouraging."

The company retired during the year $1,000,000 of its 8 per cent notes.

Kelly-Springfield Statement of Income

For the Year ended December 31, 1923

GROSS PROFIT ON SALES before depreciation		$9,559,804.35
SELLING, ADMINISTRATION AND GENERAL OPERATING EXPENSE, including cash discounts allowed customers, excise tax on sales, interest on current loans, etc.		8,797,397.84
NET PROFIT FROM OPERATIONS		$762,406.51
OTHER INCOME		345,130.17
		$1,107,536.68
DEDUCT INTEREST ON TEN-YEAR 8% SINKING FUND GOLD NOTES		770,000.00
		$337,536.68
OTHER DEDUCTIONS FROM INCOME:		
Depreciation	$1,149,759.50	
Amortization of bond discount and provision for accrual of premiums, etc.	227,796.18	
Miscellaneous deductions (including maintenance of non-operating property	126,265.34	
		1,503,821.02
NET LOSS		$1,166,284.34

Favor Aluminum Latex Cup

Importers of rubber estate supplies are reported to be in favor of aluminum latex cups, provided they can secure them at prices which offer competition with porcelain and glass cups, They have the advantage of being unbreakable and there is said to be a good field in Sumatra for 26-gram, drawn aluminum cups. Swiss manufacturers are now said to be offering these cups at 60 guilders, c.i.f. per thousand. This price is too dear for competition with porcelain cups.

In a competition held some time ago in the Federated Malay States, it was decided that the ideal latex cups must have the following points: (1) hold about 10 oz. of liquid; (2) hold a maximum of latex for a minimum of wetted surface at any instant during the filling stage; (3) surface of latex exposed to the air must be a minimum during filling, i.e. ratio of latex content to latex surface exposed to air must be a maximum; (4) designed that cleaning be easy; (5) must stand without support; (6) must be as unbreakable as possible; (7) must easily fit into ordinary hangers without risk of falling through or toppling over; (8) protruding hooks add to expense of construction; and above all (9) easy and cheap to manufacture.

NEW RULINGS MADE UNDER STEVENSON RESTRICTION PLAN

According to a statement recently issued by H. N. Whitford, Chief of the Crude Rubber Section of the Rubber Division of the Department of Commerce, certain modifications have been made in the workings of the Stevenson rubber restriction scheme. A report from Consul General Skinner of London is quoted as follows:

"Kuala Lumpur, 31st Jan.

"Following acceptance of the local recommendations for the revision of standard production by the Secretary of State for the Colonies, new rules embodying important changes are published today and become operative tomorrow. Instead of the arbitrary Duncan scale a new scale has been formulated. For holdings of over 25 acres whereon the trees were planted in 1919 standard production is assessed at 60 lb. per acre; 1918 plantations, 180 lb. per acre; 1917 plantations, 240 lb. per acre. 1916 and previously, 300 lb. per acre, all subject to the following provisos: — Firstly, rubber planted in 1919 will only be assessed if the Assessment Committee is satisfied that 60 per cent of the trees are of tappable size. Secondly, areas whereon trees have been burned out or abandoned as otherwise unfit for tapping will not be assessed. Thirdly, if trees are incapable of producing the amount allowed the foregoing scale is variable.

"Owners claiming that their holding can produce more than the scale allows must support their claim by the actual production of records for twelve consecutive months after 1st January, 1919, or, in the case of newly-opened areas, any consecutive six months. Assessment will be based on the yield obtainable by a standard tapping system either not exceeding one cut per quarter circumference daily, or permitting the minimum six years for bark renewal and eight years for second subsequent renewal. The total standard production of any holding will under no circumstances exceed 400 lb. per acre of mature rubber, and proportionately less for younger areas. The minimum rate of standard production for holdings of 25 acres or under is fixed at 320 lb. and is applicable to rubber 18 inches in girth at 3 feet from the ground.

"The effect of this revision is to reduce the allowance granted to old estates, many of which are assessed at over 500 lb. per acre. The exportable allowance of small holdings is reduced from 240 to 192 lb., and that of young producers is increased from 192 to 240 lb. It is optimistically calculated that if the Assessment Committee does its duty properly the revision is likely to affect this year's exports to a very large extent."

RECENT ACTIVITIES OF NATIONAL SAFETY COUNCIL

Four hundred safety engineers, foremen, superintendents and industrial physicians attended the mid-year safety conference of the National Safety Council's Engineering Section, the Chicago Safety Council and the Western Society of Engineers in Chicago February 19. These safety boosters represented the Chicago district, including Illinois, Wisconsin and Michigan. The morning and afternoon sessions and the banquet were held at the Morrison Hotel.

The banquet was attended by nearly 700 persons. The Northwest Region Band of the Pennsylvania Railroad and the Armour Jubilee Singers entertained with a program of band music and songs. The speakers, introduced by Charles B. Scott, of the Bureau of Safety, toastmaster, were J. L. Warner, of the E. I. du Pont de Nemours and Company, Wilmington, Delaware and Robert M. Sweitzer, county clerk, Chicago.

• • •

Industrial safety and health and public safety will be discussed by prominent leaders in the Safety Movement at the Pacific Safety Conference to be held at the St. Francis Hotel in San Francisco, April 7 to 9. The meetings are to be held under the joint auspices of the Society of Safety Engineers of California and the Engineering Section of the National Safety Council.

The first three sessions will be devoted to Industrial Safety and Health and the fourth to Public Safety. Plans have been made by many safety men in Washington, Oregon and California and Texas to attend this first big safety conference of the Pacific Coast.

• • •

The National Safety Council will hold its Thirteenth Annual Safety Congress in Louisville, Ky., September 29 to October 3, it was announced by W. H. Cameron, managing director, following a meeting of the executive committee in Chicago recently. The industrial sections of the Council already have begun to plan programs for the sectional meetings at the congress and the business and industrial leaders of Louisville are organizing committees to arrange the many details and to cooperate with the officers of the National Safety Council in preparation. Officials are planning for an attendance of more than 4,000.

• • •

The Engineering section of the National Safety Council will join with the Cleveland Safety Council, the Society of Ohio Safety Engineers, and the Cleveland Engineering Society May 16 in a comprehensive safety conference in Cleveland. The general topics to be discussed by prominent safety men are "Safety Legislation and Codes" and "Plant Housekeeping". The speakers will be J. W. Patterson, Hydraulic Pressed Steel Company; Dr. H. C. Davis; J. M. Woltz, Youngstown Sheet and Tube Company; F. C. Allen, New York and F. A. Scott, who will act as chairman at an informal dinner following the morning and afternoon session.

JANUARY RUBBER GOODS EXPORTS SHOW INCREASE

Smaller than in January last Year but Larger Than in any other Month Since August, 1923 — Drug Sundries Exports Increase Materially

Exports of rubber goods from the United States in January were valued at $2,709,319, a decrease of $223,948 from January, 1923, according to P. L. Palmerton, chief of the Rubber Division, but they were larger than in any other month since August, 1923.

In the seven months ended January, 1924, the total value of rubber goods exports was $18,601,716, as compared with $19,816,337 in the corresponding period of a year ago. This decline in the value of exports is mostly a result of decreased exports of automobile casings and inner tubes, although exports of rubber thread, rubber soles and heels, hard rubber goods, and canvas rubber-soled shoes are all lighter than they were a year ago. Exports of solid tires, waterproof rubber footwear, and all classes of mechanical rubber goods during the seven months period were at a much higher rate than in the corresponding period a year ago.

In the seven months ended January, 1923, there were exported from the United States 791,069 automobile casings, 587,523 inner tubes, and 38,489 solid tires. For the 7 months ended January, 1924, the export shipments of these classes were 540,807 casings, 466,725 tubes, and 57,658 solids, which shows how much exports of casings and tubes have decreased and how solid tire exports have increased.

Good Demand for Water Bottles

During January, 6,326 water bottles and fountain syringes were exported from the United States, the value being $6,091. Canada, England, Cuba, the Philippine Islands, China, Argentina, Chile, Belgium, and Australia were the leading markets during the month. Exports of "other druggists' rubber sundries" during January amounted to 42,884 pounds, valued at $44,956. Canada, England, Argentina, Cuba, Japan, Australia, and Mexico were markets taking over $1,000 worth of these miscellaneous druggists' rubber goods. The total value of these two classes, $51,047, is slightly lower than for December, $54,168.

Shipments of 7,688 dozen bathing caps with a value of $14,027 for the month went principally to Europe; the Netherlands, France, Denmark, and Sweden being the leading customers. South and Central America took almost no bathing caps during January. The destinations for bathing caps should indicate in a general way where other bathing accessories such as bathing slippers, swimming belts, etc., might find a market.

Exports of rubber toys, balls, and balloons amounted to 49,005 pounds, valued at $47,593. Great Britain, Canada, Argentina, Norway, and Australia were the only countries taking over $1,000 worth of rubber toys, but the wide foreign distribution of these products is indicative of a world-wide demand for such articles.

Automobile Production Increases

WASHINGTON, D. C., February 23, 1924 —The Department of Commerce announces January production of automobiles, based on figures received from 186 manufacturers, 96 making passenger cars and 119 making trucks (29 making both passenger cars and trucks). Data for earlier months include 12 additional manufacturers now out of business. Figures on truck production also include fire apparatus and street sweepers. Total revised output of passenger cars for 1923 is given as $3,636,767 cars, as against 2,339,768 in 1922, while revised truck output totaled 376,106 in 1923, as against 246,281 in 1922.

Automobile Production (Number of Machines)

	Passenger cars 1924	Trucks 1924
January	287,296	28,797

	Passenger cars		Trucks	
	1922	1923	1922	1923
January	81,696	223,819	9,576	19,720
February	109,171	254,773	13,350	22,161
March	152,962	319,770	20,022	35,260
April	197,224	344,639	22,640	38,056
May	232,462	350,410	24,097	43,678
June	263,053	337,362	26,298	41,145
July	225,086	297,330	22,046	30,663
August	249,492	314,373	24,692	30,829
September	187,694	298,911	19,462	28,638
October	217,566	335,023	21,795	30,166
November	215,352	*284,923	21,949	*28,070
December	208,010	*275,434	20,354	*27,720

*Revised.

STANDARD RUBBER TO MAKE FLOORING AND PAVING

The Standard Rubber Company of Tulsa, Oklahoma, a firm recently organized to manufacture rubber paving material, flooring, roofing and a sideline of rubber toys, has leased the idle United States Compression Inner Tube Company factory in Tulsa, it was made known recently.

The company has a score of workmen busy repairing the plant and plans to open the factory shortly, according to Arthur S. Jones, president. More than 60 men will be employed in the factory when it opens, Jones said. The capacity of the plant will be 25,000 square feet of paving and floor rubber daily he added.

The rubber company is capitalized at $300,000, the officers said, and was organized in Kansas City, Mo., where all of the tests of the product were made. The rubber-like material is made from the residue of refined oil and a high grade of clay treated chemically and heated in large vats and mixed.

The officers of the new company are: Arthur S. Jones, Independence, Mo.; Charles Orr, Kansas City, Mo., first vice-president; A. T. Miller, Tulsa, second vice-president; L. F. Anderson, Tulsa, secretary, and G. W. Greathouse, Fort Worth, Texas, treasurer. W. H. Stewart is the factory superintendent.

New Brunswick Home in New York

The Brunswick-Balke-Collender Co. have recently moved into their new building at 799 Seventh Ave., New York City. The company will occupy one of the stores, the second, sixth and seventh floors. The laboratories and New York sales offices are located here.

U. S. Rubber Subscribes to Farm Fund

The United States Rubber Company recently subscribed for $50,000 of the capital stock of the $10,000,000 Northwest Farm relief fund which is being raised for the aid of agriculture in the Northwest, according to an announcement.

The discounting and financing to be arranged with the foundation of $10,000,000 will bring 100,000,000 into the Northwest for farm assistance, so that the action of the United States Rubber Company in subscribing for $50,000 will mean $500,000 will be available for the relief and financing of agriculture. Many large banks of the East have subscribed to this fund.

Ashtabula Bankrupt

Directors of the Ashtabula Tire and Rubber Company, of Ashtabula, Ohio, filed a voluntary petition in bankruptcy in Cleveland recently, naming liabilities as $232,013 and assets as $107,979.

This action comes after a long idleness on the part of the concern which had bought the plant of the Pierce Tire & Rubber Co.

The company was organized in 1922, with C. J. Davis as president. Bonds were sold in the sum of $200,000 to finance the project, stock of no-par value being given to bond buyers as a bonus.

G. E. Ducro was vice president, and Robert Jones, Cleveland, secretary.

Realty Rubber May Rebuild

Steps will shortly be taken, it is expected, to rebuild the plant of the Realty Rubber Company at Massillon, Ohio, following the recent fire which did considerable damage to the building and severely burned oneof the workers whose clothes became saturated with naphtha. A meeting of stockholders in March will decide the future of the company. President W. A. Sonnhalter estimated the loss at $40,000, partly covered by insurance.

Receiver Asked for McGraw

Petitions asking for the appointment of a receiver for the McGraw Tire & Rubber Co., East Palestine, Ohio, were recently filed in Cleveland. A fabric mill is said to hold a note of $99,534 and other debts may total $500,000. Assets are said by officials of the company to exceed liabilities.

Ever-Hot Starts Suit

The Ever-Hot Chemical Corporation, of Newark, N. J., who for the past three years have been manufacturing and marketing Ever-Hot Waterless Hot Bags, entered suit on February 9 against B. F. Goodrich Rubber Co. of Akron, Ohio, in defense of their U. S. Patent No. 1,434,576. The suit is entered in the Third District Federal Court.

Claim is made that the B. F. Goodrich Rubber Co. have been manufacturing a rubber bag for the Radio-Pack Distributing Co. of New York City, which infringes on the patent referred to which is controlled by the Ever-Hot Chemical Corporation.

SAMSON CLAIMS FIRST "SUPER-OVERSIZE" TIRE

In a recent statement the Samson Tire & Rubber Company of Los Angeles, Cal., take credit for the present day balloon tire as a result of its "superoversize" cord tire introduced several years ago. The statement in part is as follows:

"Records show that the first complete line of "Balloon Type" tires was manufactured four years ago by the Samson Tire and Rubber Corporation of Los Angeles.

"Years ago, when developing cord tires, a careful research into the manufacturing methods of tire companies convinced Adolph Schleicher, president of the company, that the most successful type of tire would be larger than the small diameter type which had so long been in general use. Mr. Schleicher's opinion was confirmed in conference with some of the most experienced men of the tire industry. All indications seemed to be in favor of the larger size tire. Because of the increased cost, however, and the need for new equipment, the older tire companies apparently hesitated to produce such tires. It was their opinion that the public was satisfied with the standard type then made.

"Mr. Schleicher differed with this general opinion, however. He obtained information from the U. S. Government laboratories regarding the results of government tests on tires and returned to his factory on the Pacific Coast firmly convinced that the super-oversize tire was the tire of the future.

"Calling his aides together, Mr. Schleicher outlined his plan for tires of greater cross-sectional dimensions and greater cubic air content for cushioning. These are the two prime principles of balloon tire construction, and so far as is known, this company was the first to produce and sell a complete line of tires of the "Balloon Type," although the term "balloon type" was not known then.

"This new line, known as Samson Super Size Cords, was placed on the market in the summer of 1920. The sizes of these tires were identical with the standard size now adopted by balloon tire manufacturers, namely 31 x 4.40, 32 x 4.95, 33 x 4.95, 33 x 5.77, 34 x 5.77.

"So it seems that the real pioneer in the production of balloon type tires was this successful Western company. And they reaped the reward of pioneers, for nearly a million Samson Super size—the first "Balloon type" tires—have been sold."

Blaze Damages Bowling Green Plant

Masks had to be donned by firemen in fighting a small blaze which recently started in the mill room of the Bowling Green Rubber Co., 1202 Prospect Avenue, Toledo, Ohio. Damage was slight. This concern manufactures a number of hard rubber articles.

Michelin Markets 30 x 3 1-2 Balloon

A new 30 x 3½ clincher balloon tire was recently announced by the Michelin Tire Co., Milltown, N. J. This tire is 31 x 4.40 and is to be sold at a price said to be slightly under the oversize cord for the same rim. A pressure of 20 lbs. for the front and 25 lbs. for the rear tire is recommended.

In announcing the tire Mr. J H. Michelin reviewed the development of balloons by the French company and its introduction at the Paris Auto Show last September. The tire has been thoroughly tested and is said to give greater mileage and service than the regular cord.

White Rubber Progressing

Sales of the White Rubber Company, Ravenna, Ohio, are reported to be $170,000 for 1923, an increase of $70,000 over the previous year. This company is five years old, manufactures sacs for self-filling fountain pens, dropper nipples and finger cots and employs about 30. E. J. Smith is president and treasurer of the company; J. E. Smith, vice-president; Sterling Smith, secretary and J. L. Slates is factory manager.

Woonsocket on Full Time

Officials of the Woonsocket Rubber Company announced that beginning Feb. 18 the Millville plant began operating on full time. Since the first of the year the concern has been operating on a five-day schedule. About 700 operatives were affected by the increase in working hours.

The Alice Mill, which has been operating on a four-day schedule began on a five-day schedule on March 3. This change affected 1500 workers.

Midwest Tire Plant Sold

At a foreclosure sale, the plant of the Midwest Tire Mnfg. Co. in Arvada, Colo., was recently sold for $30,000 to three trustees for the first mortgage holders. It is expected that the company will be reorganized and be operated shortly.

Fire at Goodyear Plant

A fire in the lamp black pressroom of the Goodyear Tire and Rubber Co., Akron, O., recently completely destroyed the structure and its contents. Production will not be affected.

Frank F. Fox

The announcement of the passing away of Mr. Frank F. Fox of Trenton was received with much regret by the numerous friends in the rubber industry. Mr. Fox died of apoplexy on February 17.

At the time of his death Mr. Fox was Trenton representative for the Baird Rubber Trading Co., N. Y. and was owner of the Colonial Laundry Co. in Trenton. He had been connected with Baird for about 15 years, previous to which he had been with the Joseph Stokes Rubber Company.

What People Want to Know About Balloon Tires

Faults of Balloons Largely Overcome by the Virtues Of This Type Tire—Problems Which Were Overcome

By L. H. McKilwin

"TELL me what are the faults of balloon tires," said a friend a few days ago. "I prefer to know their faults rather than their virtues—their virtues I can see for myself."

There is a lot of psychology in those remarks. They indicate the mental attitude of experienced motorists, who know the comfortable feeling of riding on soft tires but have been educated to the damage that will result to ordinary tires if they are ridden under-inflated. The car owner believes he can see the major advantages of low-pressure tires, although as a matter of fact, he will not think of some of their virtues until he is told of them and may be skeptical even then until he has driven or ridden on the new tires.

He takes it for granted that the makers and sellers will tell of all the good points but will suppress the objectionable ones—and he assumes that the new tires do have some drawbacks. Experience has taught the human race to believe that every rose has its thorns and that every big improvement has to be paid for by the sacrifice of something.

Car owners want to know *all* about the new type of tire—not just its good points. They are conjuring up all sorts of imaginary objections—erecting straw men, not because they really believe them to exist, but hoping that they will be knocked down. They want to weigh the good and the bad in the balance and use their own judgment as to which way the balance dips. It is a safe policy to be perfectly candid with them, because they are eager to get the best tire equipment the market affords and will not refrain from buying balloon tires if their virtues outweigh their faults. And, unless the balloon tires are better than standard size, high pressure tires, they will not grow in popularity and be in permanent demand, so the sooner the trade knows how the public is going to react to them the better for it. Anything in the nature of deception will be a mistaken policy. Then, too, it is better not to raise a man's expectations too high; his appreciation will be greater if he finds out for himself that the tires are better than he expected, whereas, if he discovers that they have some serious faults which were concealed, he may feel like a man who has unwittingly married a woman with a wooden leg.

Tire dealers who are alive to the great opportunity of the time will get all the information they can on the balloon tire subject. First-hand knowledge is the best kind, hence the wise dealer will put balloon tires on his own car and give them a thorough trial by personal use. He will then be able to talk with convincing assurance and will also be prepared to give demonstrations to bear out his statements. He will also read all the information he can get in the rubber and tire journals and automobile papers, ask salesmen for all the facts they can give him about the tires they are selling, and inquire of balloon tire users what their experience is with them.

Two Types of Balloon Tires

There are two principal types of real balloon tires which the dealer should know about. One is the type made for 20-inch and 21-inch wheels; the other to fit the old standard 23, 24 and 25-inch wheels. Both types have major good qualities in common—such as the much greater cushioning of car and passengers, better traction and practical elimination of skidding. And both have some minor faults in common, such as harder steering at very low speed or when standing, and a tendency to give some cars undesirable motions variously termed "galloping" and "shimmying"—especially at high speed.

On the other hand, the two types have differences that are of great importance to dealers and car owners. The balloon tire as first introduced—made for small diameter wheels—is an equipment tire for new cars, while the balloon tire brought out during the last four months for 23, 24 and 25-inch wheels is a replacement tire.

Up to the present, only three or four makes of cars have balloon tires on 20 or 21-inch wheels as standard equipment, although more than thirty car makers furnish them as optional equipment at an additional cost considerably above the actual difference in price over standard high-pressure cords. None of these, with the exception of Dodge, and Reo, are very large producers of automobiles. When it is remembered that Ford makes half of the year's total output of cars and that other big makers like General Motors, Studebaker, Overland, Chevrolet, Durant, Hudson, Hupp, Maxwell, etc., do not furnish them, it is doubtful if 100,000 new cars will have such tires this year. Then, the tires on them will not need general replacement until 1925. There will be some demand on the retail tire dealer for spares and for replacements of tires that are hopelessly damaged in use, but the aggregate amount of such business is certain to be small this year.

To mount these tires on cars now in service requires either the purchase of sets of 20-inch or 21-inch wheels or the cutting down of the wood wheels already on the car and the fitting of smaller rims. There will be some substitution of steel disc and wire wheels of small diameter to take the balloon tire in place of present 23, 24 and 25-inch wheels but the expense

HAVE BALLOON TIRES BEEN MARKETED TOO EARLY?

Much criticism is being directed at tire manufacturers for their exploitation of balloon tires at this time. Many, both in and out of the industry, feel that a tactical mistake has been made in upsetting the normal spring tire market by introducing a new tire when the logical thing would have been to wait until August or September of this year.

"What can you expect the car owner to do this spring," said a tire man recently, "when he finds he needs a new tire or two? He won't buy four new balloons when he needs only one or two tires, because in the first place, he can't afford the extra cost and secondly, because he does not think that the balloon tire has been finally developed. The best evidence of this is found in the fact that few balloon tires are seen on Main Street. Despite wide advertising and exploitation, they have not come into general use as yet."

There is a likelihood that tire manufacturers may have to put the 'soft pedal' on balloon tire publicity for a while and concentrate on moving the four million regular tires which are on hand—that is, unless they feel they can stand the cost of lost sales, patronage and goodwill of the tire buying public.

of the wheels added to the cost of the tires will prevent such substitution reaching a large volume. Even the cutting down of wheels and fitting new bands and rims involves more expense than most owners of old cars will be willing to assume.

However, if public demand is sufficient, more car manufacturers will offer balloons on small wheels as standard or optional equipment, so another year or two may see a large volume of replacement business in these sizes.

On the other hand, the placing in the market of balloon tires to fit present cars has opened a tremendous field for immediate sales of replacement tires. It is replacement business with which the dealer is concerned and it is these tires that he will need to get most information about at once. They raise more doubts in the minds of car owners than the equipment balloons, first, because there is more prospect of purchase without waiting to buy a new car, and second, because the problem of fitting them on present cars appears greater.

As the cars were not designed for tires of such large diameter and cross section, the first thoughts that occur are, Will there be room enough for them under the fenders?, Will they rub against the side of the body or side frame?, Will they raise the car too high from the ground?, Won't they cut down the power of the car on hills and in heavy going? and How will they look on the car?

Tires Thoroughly Tested

The makers, of course, studied these problems and made tests of the tires before they offered them to the public and they have ready answers to dispel all such doubts. It is admitted that there are some cars whose fenders are too close to the present tires or rims to permit of mounting a much larger balloon tire, and unless the tire is considerably larger the air pressure will not be low enough to give greatly increased cushioning effect as compared with oversize cords. And it is also admitted freely that the turning angle of the front wheels must in many cars be reduced so that the turning radius is not quite so short. This, it is pointed out, is of no real consequences in cars of short wheelbase, while a long wheelbase car cannot turn in an ordinary street anyway without backing.

Those who think the tires will raise the car higher from the road and reduce the power of the car overlook the fact that the low-pressure tires flatten out considerably under the weight of the car, so that the rims are as close to the road surface as when they rest on a highly inflated tire that stands up round from the road. Therefore, the center of gravity of the car is not raised and the power of the car is not affected to any greater extent than when the ordinary oversize tire is substituted for the normal size, because the driving radius, or distance from the driving axle to the road surface, remains practically the same.

Either type of balloon tire may cause a car to "gallop," or have a forward pitching motion, under certain conditions, such as a short wheelbase and fast driving over a wavy road. The motion is believed to be due, in some cases, to lack of balance in the tire and wheel. The wheel can be tested for balance easily by jacking it up and noting whether one side swings rather quickly to the bottom. Mark this side and then put on a casing without the inner tube and test the wheel again for balance. Then mark the casing at the low point. When mounting the tire and tube again, place the heavy side of the casing, if it has any, opposite the valve hole in the rim, so that the heavy side of the casing will be opposite the tube valve. A wheel and tire that are much out of balance will tend to rotate around their own center of weight and give the axle an eccentric motion which will be communicated through the springs to the body of the car when driving at high speed. Some of the tire makers are reported to be balancing their balloon tires by placing the tube splice opposite the valve instead of close to it.

How to Prevent "Shimmy"

Certain individual cars fitted with balloon tires may develop a front wheel wabble or "shimmy" at a speed of fifty miles an hour. The cause of this does not appear to have been definitely determined but it is ascribed by some to design of the steering mechanism or the toe-in or the angle of castor of the front wheels. A little more inflation pressure in the front tires, it is asserted, will usually prevent "shimmy."

As regards steering, of course, the smaller and harder a tire is and the nearer the bearing surface approaches a point contact with the road, the easier it is to turn the front wheels. This holds true when the car is at rest or making a short turn at very slow speed, but it does not hold at normal speed when the wheel is revolving faster than the turning movement. Without going into the technical reasons, it is sufficient to say that the experience of driving long distances on balloon tires proves that there is less steering fatigue than with high pressure tires. This is because the steering wheel does not have to be turned so incessantly to avoid small holes and stones, does not need to be held so firmly in rough going and does not vibrate so much.

Special Chains for Balloon Tires

Tire chains can be used on balloon tires fitted to standard rims on cars that have enough clearance so that the cross chains will not strike the fenders. Several of the chain companies are now making chains to careful measurements to fit such tires and have sold them for use with several different sizes. However, it is declared that the tires give such good traction and resist skidding so effectively that there is no need for tire chains, and that attempts to make them skid even on icy roads have failed. But undoubtedly it is the better part of wisdom to be cautious rather than over-confident of the non-skidding quality until much driving under all conditions of slippery roads has proved just how much these tires can be depended upon not to skid. There are some conditions under which even chains will not positively prevent skidding.

Inquirers find it difficult to believe that the thin balloon tire will not cut, puncture and blow out more easily than the thicker high-pressure tire and that the side walls will not wear through more quickly from running in ruts. It is asserted, however, that considerable road use has shown that the balloon tire is actually less vulnerable than the ordinary cord. This is explained as due to the low pressure which allows stones and other objects to force the tread or side wall inward, the pressure inside the carcass being less than the force required to drive the point or edge through the rubber and fabric or to scrape the rubber from the wall. It will take at least a year of use to settle the question of whether the tread of the balloon will wear as long as that of the ordinary cord but, considering that double the area is always in contact with the road and that the weight per square inch is reduced by half, it ought to be much more durable although the tendency will be to drive more rapidly over rough roads and to be less careful of the balloon tires.

Fuel Mileage Unchanged

The matter of fuel consumption looms large in the minds of some. They apparently do not stop to consider that even if it should be greater with balloon tires, the decidedly better cushioning of the car will decrease the jolting and vibration of the car to such an extent that the saving in adjustments, repairs, replacements and general depreciation will more than compensate for the extra fuel cost. But actually, the mileage per galloon is as much with ballons as with other tires, according to testimony. This is not hard to believe when it is remembered that, although there is more flexion, there is less internal friction in the tires because of the fewer plies of fabric used, and that there is less need of driving in first and intermediate speeds so that the car is run more uniformly at the most efficient engine speed.

In the foregoing only the doubts that arise most commonly have been dealt with, and that somewhat superficially, but from what has been written it will appear that the principal "faults" either do not exist or are of little importance as compared with the "virtues" which are so patent to the experienced automobile owner.

The Stretching of Cotton in Pneumatic Tires

Present Methods Produce Uneven Results—Advantages of Unit-Controlled Tension Applied to Individual Rubberized Strands—Applicable to Balloon Tires

By **Arthur E. Friswell**

IT is compulsory to apply such tension to the cotton in the process of building the tire carcass, or during the vulcanizing of the tire, or both, as will insure non-stretching or enlargement of the tire in service. At the same time it is highly undesirable to carry this stretching beyond what is necessary as the retention of as much as possible of the elasticity of the cotton is an important factor in the durability of the tire.

All tire manufacturers know that tire expansion in service results in rapid wearing away of the tread (which should not be under tension at all) that such expansion renders the tread liable to easy cutting, to the introduction of sand and gravel into the cuts and the shuffling loose of the tread. Most tire manufacturers also know that overstrained cotton results in premature blow outs because when the elastic limit of the yarn and fibre is reached a comparatively slight blow from impact breaks it. It has no yielding resilience.

Can Tension Limits Be Controlled?

It is obvious that as tension must be applied within safe elastic limits, such limits should be known, and such tension should be susceptible of safe uniform control. Is it possible to pre-determine the one and control the other? Yes; but by more advanced scientific methods of carcass structure than are now employed.

So long as tire carcasses are built up of plies of bias cut material, the desired uniformity of tension cannot be secured.

The breaking strain and stretch of the yarn are simple matters to determine with modern laboratory testing equipment; without such tests there is no check upon the cotton, nor any control whatsoever over its subsequent behavior in tires, but the great majority of manufacturers who do make such tests constantly as a matter of course, cannot by present methods of tire construction control with reasonable accuracy the tension applied to the web of material during the various processes through which it passes in the tire factory from the initial drying to the final stretching prior to the introduction of the tire within the mold or while it is within the mold, or both. The stretching during calendering is uncertain. It varies from end to end of the roll. Manufacturers of rubber belts have realized this for many weary years.

Effect of Variable Tension

The stretching at the bias cutting machine is uncertain, and uncertain liner adhesion and separation during this operation increases the uncertainty. The recovery from strain is again uncertain, so that when the bias cut plies reach the tire building machine or the hand builder, such variable tension has been given that there is nothing standard from which can be calculated how much remaining stretch is required for laying the plies or how much should be allowed for expansion by pressure before or during molding, or both. Where variables occur at the start and continue throughout a resultant constant is impossible. The writer has had in mind for some time a presentation of views upon this subject but the wide-spread discussion of the Balloon Tire development has brought sharply to his attention (as doubtless to that of many others) the necessity for threshing out the matter, because while it has always been worthy of much more serious consideration than it has received, it was never so much so as at present when in the Balloon Tire construction thinning the tire walls by reducing the number of plies by one-third or more, calls for an immediate close examination into the wearing strength of what remains, and the necessity for fortifying any existent weakness always inherent in the thicker wall, though not so importantly apparent as in the lighter structures which are now eagerly awaited by the public while causing grave concern to the manufacturers.

Superiority of Unit Controlled Tension

It has been the writer's privilege to study closely for some time a process of unit-cabled cord construction of tire carcasses in which the tension applied to each individual rubberized strand of each individual cabled cord is not a variable but a constant in which the tension applied to each rubberized cabled cord is a constant, in which the tension applied to each strip of five rubberized cabled cords, more or less, of any selected weight or quality of yarn is a constant, in which a given controlled tension is held and never released from the initial stretching of each strand to the final laying on the core in the exact position that the strand assumes in the finished mounted inflated tire in service. It means automatic, scientific elimination of all the bothersome, costly variables discussed, so that having pre-determined in the laboratory by a breaking strain and stretching test requiring but a few minutes, the strength and elastic limit of each cord, there is a known factor to work from, and all subsequent tension is automatically adjusted accordingly. For instance, if a length of rubberized cabled cord stretches 24 per cent at break under an indicated load and the tension applied during the carcass building is 4 per cent calculated to the same load, by adjustable weight mechanism the final percentage of stretch permissable within a safe elastic limit immediately prior to or during molding, or both, is a matter of simple calculation which can be checked with mathematical precision within 1 per cent to 2 per cent by pressure applied to the finished mounted tire. Assuming 6 per cent permitted stretch for the final operation, the tension applied throughout is a known 10 per cent from a known 24 per cent, leaving a known margin of 14 per cent within which the tire does its work with no overstrain or enlargement.

The extremely satisfactory results obtained by the process referred to, have been checked and re-checked in the manufacture of over one hundred tires, using the rubber materials of prominent tire manufacturers, but varying the weight and sizes of cotton employed, varying in consequence the thickness of wall and the air space within the tires, with no change in outside measurements. These tires have been, and are being subjected to various severe laboratory hydrostatic and endurance tests, *and to abnormally severe road tests which prove conclusively that the process has accomplished and is accomplishing all that is claimed for it* in the direction of cotton stretching control. In not one single instance has it failed, nor, given the requisite preliminary test of cotton referred to, is it possible for it to fail, because scientific automatic control of tension throughout positively eliminates variables, positively eliminates the human equation. Nor is all this accomplished at the expense of reduced output or by intricate complicated mechanism offsetting wholly or in part the object attained, but on the contrary, output is simultaneously increased, and costly supervision is rendered unnecessary.

A Boon to Engineers

To all harrassed tire construction engineers who have had either to guess what a change in cotton weight and quality may mean in tire service, who have had either to take a chance from forced competition or to wait as patiently as they could for exhaustive destruction tests, this substitution of certainty for uncertainty is a veritable boon.

Synthetic Leather Made from Rubber

First of a Series of Technical Articles by the Well-Known French Chemist and Writer

By **Andre Dubosc**

IF a hide, which is to be converted into leather by tanning operations, is examined, it is easy to see that it consists of two superimposed layers.

One of these layers, which is known as the epidermis, is composed of two parts, the cuticle and the Malpighian tissue. This layer is of no interest, for it disappears during the preliminary tanning operations. The second layer, which is known as the dermis or chorion and which lies under the epidermis, is made up of an interlacing of cutaceous fibers which are tightly felted together into an elastic mass. The top side of the chorion is in contact with the Malpighian tissue and this side is what is known as the hair side of the skin and gives the hair or grain split when leather is made. The under side of the chorion, which comes in contact with the hypodermis or the conjunctive tissue, is formed of an interweaving of fibers which are much coarser, much less supple and much less resistant than the small fibers of the upper part of the chorion. This side of the hide is known as the flesh side and in the manufacture of leather it yields the flesh split.

Chemical Properties of the Hide Layers

The two layers, the dermis and the hypodermis, before the tanning operation, have the appearance of a milky white tissue, which is very soft, flexible and which is constituted of bundles of twisted fibers, united with each other in every conceivable way, entwined and interlaced with one another. These fibers cover the surface of the skin in parallel rows. The fibers are colorless, translucent and show numerous ramifications. They are constituted of an organic substance which is known as coreine. This substance, when subjected to the combined action of both water and heat, may be converted into gelatine.

The prime purpose of the tanning operation is the conversion of the decomposable tissue, the dermis and hypodermis, into another tissue which is not decomposable, but which is flexible and strong, in other words, leather. This is accomplished by saturating the fibers, which make up the hide, with tannin, a substance which possesses the property of combining with coreine and forming with it an insoluble substance which cannot be changed into gelatine. During the course of this operation, the skin retains its physical texture, its morphological structure. The only change that takes place is in the chemical properties of its constituent fibers.

When a piece of tanned leather is examined under the microscope, it will be evident that it is formed of innumerable fine fibrille, interlaced and felted together, saturated with tannin, all firmly combined with each other. This produces the well-known mechanical strength and elasticity of leather. For the same reason, the constitution of the skin, as has been described above, the hair or grain side of the leather, which is formed of the chorion, containing numerous intertangled fibrille, possesses a mechanical strength and elasticity which is far greater than those of the flesh split, which is formed of the hypodermis containing but few fibrille.

The elongation, the mechanical strength and resistance to rupture are not the same in both splits. The physical constants of both vary to some degree, according to the nature of the skins and the part on which these mechanical strength tests are made.

Physical Properties of the Two Splits

The elongation under tension of tanned hides, treated with oak bark, is a maximum of 24 per cent. In leather which has been tanned by the chrome tanning process, it reaches a maximum of 50 per cent. The minimum elongation under tension is given by a sample of Buffalo chrome tanned leather, which is approximately 22 per cent. The resistance to breaking of the last-named leather is, however, quite considerable. When the test was made with a fresh sample of leather, it was found that it could resist the tension of a force of ten kilograms per square millimeter, while in the case of leather which had been tanned with various tannins, the maximum resistance to rupture was found to be on the average six kilograms per square millimeter.

The breaking of the leather is brought about by the tearing of the interlaced and felted fibers.

Ordinary leather belts or straps possess an average breaking strength of approximately two kilograms per square millimeter. In the case of shoe leather, that is sole leather, the breaking strength does not attain this figure. European railroad specifications for leather set an average resistance to breaking of 2.5 kilograms per square millimeter.

This short review of the constitution and the properties of leather may lead us to define leather as being formed of an interlacing and felting together of numerous fibrille, which have been rendered resistant to water and imputrescible by the tanning operation. It also enables us to see that the mechanical properties of the leather, its elongation and breaking strength, are due to the felted structure.

The History of Artificial Leather

Pseudo-leather, artificial leather and synthetic leather are substances in which an attempt has been made to reproduce the felted structure of real leather, a structure analogous to the aggregation of fibrille in the chorion. These forms of leather are composed of fibers of diverse origin, such as wool, cotton, linen, jute, asbestos and even leather dust and refuse, which are all bound together by means of a suitable binder, usually rubber or gutta-percha. The whole mass is united firmly by being subjected to vulcanization and at the same time it is rendered insoluble and waterproof.

This method of making an artificial or synthetic leather was first devised by Gaffray in 1867 and later patented. This discovery however had but slight industrial success. It was taken up again a few years later in France by Dubert and Gerard, who were the first to put on the market soles made of artificial leather, which fulfilled all the requirements of the shoe making industry.

The low price of leather at that time and the comparatively high prices of both rubber and gutta percha did not permit the two engineers who started this project of manufacturing synthetic leather to make any considerable industrial progress with their process and their efforts in this direction were almost entirely forgotton when the chemical engineer Lewis brought forth a leather from the Goodyear laboratories in Akron, Ohio, in 1915, which was made synthetically from a rubber base and which was given the name of Neolin. This artificial leather is made of a mixture of fibers of various sorts, rubber and gutta-percha mixed together with great care, so as to form a mass of interlaced fibers, perfectly felted together.

The Success of Neolin

The great scarcity of leather due to the demands for making supplies for the armies in the field during the World War, the very good quality of the product, (whose resistance to wear is almost three times as great as that of leather), the lightness of the product and the great publicity that was given to it, all led to a rapid growth in the output of this product from the Goodyear factories. * A number of other

American rubber concerns also put on the market artificial leather products, following the lines indicated by Gaffray, Dubert, Gerard, and Lewis, and are now engaged in the manufacture of synthetic leather soles and heels. Within recent times the production of these articles has reached the considerable total of 80 millions of pairs of soles and 75 millions of pairs of heels.

Properties of the Rubber-Leather Products

The qualities of these leather substitutes which have been instrumental in making them so successful and popular among shoe makers, are dependent on the manner in which the rubber batches are made up, on the degree of felting that is secured in the mass and the way in which the mixtures are vulcanized.

Compared with leather soles, Neolin soles and others like it, are more lasting, more resistive to water and much cheaper. There are other advantages which may be added to these and which are mainly dependent on the manner in which these products are manufactured, or are inherent in the product itself. For example, the solidity of these products is such that real leather soles and heels can never have, as the latter are composed of a great number of particles placed in juxtaposition, while synthetic leather or neolin is made of a single piece of a substance which is perfectly homogeneous. Due to the fact that rubber is a rather poor conductor of heat, soles which are made from rubber compositions prevent the cold of the pavements from being transmitted to the foot, something which leather cannot and does not do. Then again, they can support quite a high degree of heat without being affected adversely. Ordinary leather when submitted to a temperature of only 100 degrees C, becomes hard and cracks. Artificial or synthetic leather, when subjected to a temperature as high as 150 degrees C, does not deteriorate.

Materials Used in Making Synthetic Leather

The materials that are employed in the manufacture of synthetic leather or leather substances are many in number and some of the more important ones may be enumerated here:

Virgin rubber	Accelerators
Gutta percha	Wool refuse
Rubber resins	Cotton linters
Pontianak	Carded cotton
Jelutong	Refuse from old tires
Guayule	Shearing from velour and tapestry
Accra	Wool shoddy
Reclaimed rubber	Hair waste
Fibers of various sorts	Waste from cotton fabrics
Linen waste	Jute refuse
Wood pulp	Ground leather waste
Waste from hides	Fillers
Coloring matters	Abrasives, etc.
Sulphur	

The quality of the finished product varies in accordance with the various gums that are employed as binding agents in its manufacture and also in accordance with the nature of the fibers that are used to bring about a felting of the mixture into a solid mass.

It is evident that when the leather substitute is manufactured from rubber of the first quality, gutta-percha, shearings from wool cutting or carded cotton waste, the product will be of a higher quality than that which is manufactured with reclaimed rubber, Pontianak, factice and the waste fibers that are recovered from old automobile tires. The mechanical properties of these two leather substitutes, their resistance to breaking, their elasticity and suppleness, the wear and tear that they can stand will be quite different. The quality of the product is thus unquestionably a direct factor in its cost.

It is easy to see from the multiplicity of materials that can be used in the manufacture of synthetic leather or leather substitutes that the products sold on the market should have greatly varying qualities, different values as far as the service they render is concerned and different prices. The nature of the business that is done by the shoe company and the results that were obtained with the product in actual usage, led the manufacturer to determine what sort of materials he should use in making his product.

Besides the leather that is used in making the heels and soles of shoes and boots where there is the largest market available, artificial leather made in this manner can also supplant the natural product in most of the uses to which the latter is being put at the present time. This is particularly true in the case of those applications which demand a product of great breaking strength, as in leather belts and straps, harness for horses and military equipment. In these cases the method used in making the product may be quite different from that employed in the manufacture of leather soles and heels.

Methods of Making Pseudo-Leather

In general there are two categories into which all the processes of manufacturing pseudo-leather can be divided. The first process is known as the felting process, which includes the leather used for soles, for use in malt houses and various other industrial leathers.

The second method, which is known as the impregnation process by which is made the leather used for belts and straps, harness, and leather which is destined for manufacture into military equipment.

In the felting method, which by the way does not differ in any way from the French process employed by the original investigators, Dubert and Gerard, all the various constituents are first mixed together. Then the pastry mass which is obtained in this manner is spread out in the form of sheets and subjected to vulcanization.

On the other hand in the impregnation method, the constituent fibers are first made into a felted sheet of material. This is then impregnated with a solution of rubber and then the surface is covered with a layer of gum and fillers by passing the impregnated sheets through a gumming machine. These two methods are given below in detail.

The Felting Method

The rubber batch, which is used in the manufacture of pseudo-leather soles, is composed of a mixture of rubber and various filamentous and weighting substances. To this mass a certain proportion of sulphur is added in a greater or lesser amount in accordance with the degree of hardness that it is desired to attain in the finished product. In the manufacture of synthetic leathers of the highest quality wool refuse is the one substance that is used to give the product a fibrous structure. In the manufacture of inferior grades of leather substitutes cotton waste is used on the waste that is recovered from removing the nap of fabrics and in some cases the fabric from old tires.

As far as the actual manufacturing process is concerned, it may be said that it is inherently very simple.

The rubber mixture, containing the above ingredients, is mixed on the regular type of mixer until the proper degree of plasticity has been acquired. Then gradually and in small quantities at a time the various fibrous material, the loading materials, the sulphur and the accelerators are added to the rolls. After the proper degree of homogeneity has been attained in the mixed mass, it is passed between calender rolls which flatten it out into sheets of any desired thickness. The calendering operation is conducted in such a manner that a continuous sheet of approximately one millimeter in thickness is obtained. This sheet is then cut into large squares, the dimensions of which correspond to the width of the sheet that has passed through the calendering machine. These pieces are then piled one on top of the other until a pile is obtained which has the proper height and will give a thickness of product which can be used directly in the manufacture of soles.

Building the Sheets into a Solid Mass

In making this pile of sheets which is to be converted into a solid mass, care is taken to see that the sheets are piled up in a very definite manner. The second, fourth, sixth and eighth sheets, etc. are laid on the pile in the direction of the grain and the first, third, fifth, seventh, ninth, etc. sheets are placed on the pile in the opposite direction. The pile of sheets is therefore made up of crossed parts.

The reason for doing this is as follows: During the process of calendering the mass of rubber is stretched very considerably in the direction of the length of the sheet due to the fact that the rubbery mass adheres quite tightly to the cylinders of the calender. But due to the small clearance between the rolls of the machine only a very small proportion of the mix-

*According to advices from The Goodyear Tire & Rubber Co., Neolin soles are no longer manufactured.—EDITOR

ture is squeezed through between the rolls, almost the entire mass of the mixture being piled up behind the rolls. The result of this is that the fibrous materials, which are mixed up with the rest of the ingredients and which are constantly pulled and drawn out in the same direction, that is the direction of the travel of the sheet, finally come to assume a position parallel to each other.

It is therefore evident if the squares that are cut out of the sheet of rubber mixture are not arranged cross-wise in building up the soles, a product would be obtained which would possess a two-fold character in accordance to whether it were being examined from one side or the other. In one direction it would be very easy to tear the product in the direction of its grain, and in the other direction this would be very difficult for it would be necessary to tear it across the grain.

At times if the sheet is not calendered but is drawn out to the proper thickness right in the first step and is rolled out in the calendering process to the thickness that is required for manufacture into soles, (when certain precautions are taken in later steps of the process) it is possible to obtain a product in which the proper degree of felting has been attained. Attention must also be paid to compounding the mixture in the proper manner to allow such a process to be carried out with it. This is a very delicate operation and its success depends on the nature of the formulae employed in making the mixtures, on the temperature to which the mixture is heated by the rolls of the calender, on the manner in which the fibrous substances are added to the mixture and above all on the personal skill of the operators who are in charge of the calendering. However, the longer method of building up the mass from a number of individual sheets always yields a product of good quality.

After the cut squares have been arranged in the proper manner, one on top of the other, to the desired thickness, they are cut into soles of various sizes, whole soles, soles without heels of equal thickness throughout, etc. by being passed through a punching machine, in which a variety of dies is used. Heels may be cut out at the same time and glued to the soles by means of a rubber solution. In this way a complete heel and sole is obtained, ready for attachment to the upper of the shoe. It is common practice to glue a piece of very strong cloth, covered with a thick coating of rubber adhesive, on the inner side of the sole. This is done to increase the strength of the sole and its resistance to the cutting action of the vamp.

The Molding Operation

The exact shape of the sole, its curvature, is given it by the shape of the mold which is used in the next step of the process. The molds are made of cast iron and are composed of two parts, which fit together exactly. The interior of the mold is machined and polished with care. After the rubber soles have been covered with the cloth as has been described above, they are placed on a steam table so as to be softened. The molds themselves, while this heating process is going on, are also heated on a table of similar construction. When they have attained the proper temperature, the soles are placed in the molds. Then the two sections of the molds are subjected to gradual tightening until both halves close tightly.

In order to obtain satisfactory results it is generally customary to smear a little of the raw materials over the soles. This excess of material serves to form a tight joint between the halves of the molds when they are pressed together.

Having been tightly clamped, the molds are introduced into a vulcanizer. The pressure is increased until it reaches three atmospheres and is maintained there for one hour. The pressure is then reduced and the molds are removed from the autoclave. The soles are taken out of the molds and the rough edge which corresponds to the juncture of the two sections of the mold is buffed off.

The manufacturing process which has just been described is used in the manufacture of soles with heels.

If it is desirous to manufacture soles without heels, soles with half heels or just heels alone for repair purposes, then the process is somewhat different.

After the sheet of material has been obtained, either by a single step or by building it up from a number of individual thin sheets, it is vulcanized in the regular manner in a platen press. After vulcanization the soles, or half soles are cut out of the sheet and these are then put on the market directly.

The heels are cut out by means of a punching machine from a sheet of the proper thickness before vulcanization. They are then placed in molds which are provided with three points which leave small depressions in the heels through which the nails (which are employed for fastening the heels to the shoe) are able to pass. The molds are made in two parts and contain from twelve to twenty-four cavities for insertion of the heels. After the molds have been clamped, the vulcanization process is carried out either in the press or in an autoclave.

The soles that are obtained by this process can be nailed, sewed and manipulated in other ways just like ordinary leather. They are cheaper, longer wearing and more resistant to moisture than the ordinary leather soles and to these advantages there may be added others which depend on the manufacturing process. These properties are particularly important in the case of thick soles or those used in making working shoes. Such soles are much stronger than leather soles because of their homogeneity of structure.

The Impregnation Method

This method consists first in changing the fibrous refuse which forms one of the essential parts of the finished product into a sheet of felted material. This transformation is carried out by means of machines which are usually employed for this kind of work. In the state of a carded "nappe" this felted sheet is now passed into a thick solution of rubber which penetrates through the structure of the fibers and fill likewise the interstices which separate them.

The impregnated sheet then passes to drying tables on which the rubber solvent is removed by evaporation. After the drying operation is completed the sheets are passed between the calender rolls. The rolls of this machine are engraved so that the grain of real leather is impressed on the surface of the sheet of pseudo leather. The sheet of it is then submitted to vulcanization which is accomplished with the aid of hot air in a vulcanizing machine of the Wadington type where a continuous sheet of rubber passes through and is vulcanized by the time that it emerges from the far end of the machine.

The synthetic leather or leather substitute which is obtained in this manner has a much greater resistance to tension than the pseudo leather that is manufactured by the felting method. This is due to the fact that felting of the fibrous material into a solid sheet can be carried out with a greater degree of proficiency than the felting action when building the product from a number of sheets of rubber compound as described above. The breaking strength of the sheet is approximately 6,250 pounds per square inch in the case of impregnation process leather, in other words about four times that of the leathers that are manufactured by the felting process.

By inserting cords in parallel lines through the structure of the felted sheet it is possible to increase the resistance to breaking to approximately ten thousand pounds per square inch, which makes it possible to use the pseudo-leathers in the manufacture of transmission belts.

This type of artificial leather is also used, when made in the right thickness, to replace chrome tanned leathers in the manufacture of non-skid devices. This application of pseudo-leather is one of its most interesting uses and opens up a large field. It is in reality much easier to fit a band of non-skid material on an automobile tire before the latter is vulcanized and then vulcanize the two together so as to obtain a firm union between the non-skid tread and the tire itself than to try to place the tread on the tire after the latter has been made.

The important consideration is the union between the tread and the tire, for when chrome tanned leather is used for this purpose it has to be glued to the tire, an operation which is very difficult to carry out to obtain good results. There is no question but that a more firmly united product can be obtained in this manner.

The leather substitute industry seems to have been resurrected after being forgotten for many years. The future is very bright. For according to the formulae by which these various pseudo-leathers are produced the products may be used in place of real leather in many of its applications.

German Rubber Industry Reported in Unsatisfactory Condition

Reports Indicate Demands for Home Consumption Have Decreased as Result of High Prices — Foreign Business Also Declines — Some Factories Operating on Part Time

THERE are in Germany 334 factories engaged in the manufacture of rubber wares. Twenty-two factories are classed as large or medium sized; 312 are small plants. Among the 334 are 42 engaged in the manufacture of rubber wares for surgical purposes, 37 manufacture of rubber tires, 32 make rubber soles and heels, 35 make rubber belting and bands, 29 make rubber packing for stuffing boxes, 24 manufacture cables, 19 make impregnated cloths and 11 manufacture balata articles. There are 2,470 dealers in rubber wares.

In 1921 Germany's exports of rubber goods totaled 8,000 tons, in 1922, 12,100 tons.

According to the figures of a trade journal, German production of rubber goods in 1913 and 1922 was as follows:

	1913	*1922*
	in tons	
Automobile and bicycle tires	14,200	42,500
Surgical wares	750	1,250
Technical rubber goods and inner tubes	4,520	6,420
Rubber belting	2,340	2,850
Rubber footwear and soles	3,860	5,760
Small rubber articles	2,630	3,500
Rubber balls and toys	1,790	1,300
Textiles impregnated with rubber and material for rubber balls	5,240	9,600
Hard rubber wares	3,380	4,300
Sport articles and miscellaneous	1,270	750

In the spring of 1923 the German rubber industry employed about 60,000 workmen. The domestic demand for tires, technical rubber goods, sporting goods, rubber wares for surgical purposes and soft and hard rubber at that time was good. At present the condition of the industry is unsatisfactory. While down to the end of 1922 important foreign orders were received by German manufacturers, foreign business now has almost ceased. Because of increasing costs of production, there has been a recent decrease in exports both of soft and of hard rubber wares. In addition, high prices have caused an estimated 75 per cent reduction in the domestic demand.

In the first half of 1923, 114,000 automobile tires were exported as compared with 62,000 during the same period of 1922. A large part of the 1923 business came from South America. Approximately 2 million bicycle tires were exported in the first half of 1923, as compared with 1.6 million in the corresponding period of 1922. It is reported that tire manufacturers are endeavoring in every way to improve the quality of their products. Research men in experimental laboratories are striving to increase the elasticity and toughness of tires and inner tubes. The factories producing rubber wares for technical purposes are closely associated with the big industrialists in Germany, and are able to devote large sums to research and experimental work.

According to the *Gummiwelt*, manufactures of rubber belting, rubber packing material and rubber hose and tubes for the mining industry totaled in 1923 approximately 222,500 tons. The factories were prepared to do a much larger amount of business in 1923, but suffered heavily from the unsettled domestic conditions and from increases in production costs which made exports difficult. At the present time business is so poor that many large factories are operating only three days a week.

Compiled from reports made by American Consuls to Department of Commerce, Washington, D. C. Issued by Rubber Division.

Conditions in Hessen and Hessen-Nassau

The rubber industry and trade in Hessen and Hessen-Nassau centers chiefly in the manufacture and export of tires for motor cars, motor cycles, and bicycles, there being three large and important rubber concerns at Frankfort, one at Hanau, one at Fulda, and one at Offenbach. There are also in this consular district several smaller concerns manufacturing various rubber articles, such as hygienic and hard-rubber goods, soles and heels, combs, etc.

The tire business, which was formerly exceptionally good, with factories running full time and goods disposed of as soon as manufactured, fell off considerably last fall and factories ran only part time, the principal cause for this being the difficulty encountered in obtaining sufficient foreign currency to purchase raw materials such as crude rubber, cotton, etc., from abroad. A large manufacturer of automobile tires whose works were closed almost entirely last fall stated that although he had plenty of foreign orders on hand, especially from Scandinavia, he could not execute them while the unstable conditions of German currency continued; that, although he could sell his enitre output in Germany, he preferred to stop manufacturing rather than accept payment in the paper currency of the country.

The demand for heavy truck tires has greatly increased during the last two years owing to the increasing number of motor lorries now used, especially in the large industries. One of the best domestic markets for the heavy tires manufactured at Frankfort is the Rhineland, with its great iron and other industries. This market, however, has been entirely cut off since the Ruhr occupation. About one-third of the tires manufactured in Hessen and Hessen-Nassau are exported, chiefly to England, Scandinavia, the British colonies, and Italy.

Germany's Trade in Crude Rubber

Germany's total imports of rubber during the first half of 1923 were 12,725 metric tons, against 16,847 tons in the corresponding period of 1922, according to the *Stuttgart Das Industrieblatt* of Dec. 5, 1923. The decrease in imports of crude rubber during the first six months of 1923, compared with the same period of 1922, amounted to approximately 30 per cent. The decrease in imports of caoutchouc was 22 per cent, gutta-percha 56 per cent, balata 71 per cent, and in scraps 35 per cent.

The imports for the first six months of 1922 and 1923 were as follows:

Germany's Imports of Rubber

Items.	January-June, 1922 *Metric tons.*	January-June, 1923. *Metric tons.*
Caoutchouc	14,256	11,189
Gutta-percha	364	159
Balata rubber	226	68
Used rubber and scraps	2,001	1,309
Total	16,847	12,725

Imports from Dutch East Indies Large

The chief sources of Germany's rubber supplies are the Dutch East Indies, Ceylon, British India, and Brazil. During the first half of 1923 the Dutch East Indies supplied 5,193 metric tons, as compared with 4,462 tons the first six months

of 1922. Ceylon supplied 2,242 tons in 1923 and 3,154 tons in 1922. The imports from British India amounted to 1,721 metric tons the first half of 1923, against 3,312 tons in the corresponding period of 1922, while Brazil furnished 674 and 1,514 metric tons during the same period, respectively.

In contrast to the decrease in German rubber imports from Ceylon, British India, and Brazil, it is interesting to note that Germany's imports from the Dutch East Indies increased about 16 per cent and constitute almost half of Germany's entire importation of crude rubber. The Dutch East Indies supply Germany with the largest part of gutta-percha; 83 metric tons during the first half of 1923, against 245 tons the first half of 1922. Balata rubber was imported chiefly from Brazil, 48 metric tons being imported during the first half of 1923, as compared with 21 tons during the corresponding period of 1922. The United States supplied Germany during the same periods with 433 and 681 metric tons, respectively, of scrap rubber.

Exports of Rubber from Germany

Germany's exports of rubber during the periods under discussion increased from 603 to 1,021 metric tons, an increase of 70 per cent. The following is a list of Germany's exports of rubber:

German Exports of Rubber

Item.	January-June, 1922. *Metric tons.*	January-June, 1923. *Metric tons.*
Caoutchouc	180	472
Gutta-percha	5	7
Balata rubber	7	45
Used rubber and scraps	166	306
Caoutchouc imitations	245	191
Total	603	1,021

Germany's principal customer for caoutchouc was Austria, which purchased 156 metric tons during the first six months of 1923 and 69 tons in the same period of 1922. It will be noted that Germany's exports of caoutchouc during the first six months of 1923 increased as much as 162 per cent over the previous year's sales, and that the increase in the exports of scraps approximated 85 per cent.

Relaxations of Import License Restrictions

Several hundred commodities hitherto subject to license may now be imported into Germany without restriction, according to a decree effective from Jan. 11, 1924. The commodities affected are for the most part raw materials or semi-manufactures, though certain finished articles that are not altogether competitive in their nature are included also. This is the first material relaxation of the German import license régime, which has been in operation for several years.

The chief groups of articles affected are as follows:

Rubber goods.—Artificial caoutchouc made with oil, and rubber substitutes; rubber cement; certain hard and soft rubber goods (not including automobile and truck tires, rubber footwear, and belting).

German Import Duties on Rubber Goods

German import duties levied on rubber goods are the same for all countries.

Importation of the articles coming under Item Nos. 573, 575, 577, and 578 (tires and covers, threads, driving-belts, footwear, and gramaphone records) in the following schedule will not be permitted unless the German importer has obtained a Government license beforehand. Other items in this schedule are free of import license requirements.

The rates are stated in gold, actually payable (converted into German banknotes, Reichskassen notes, or Darlehnkassen notes) at the official gold ratio prevailing on the date payment is made. The mark is equal to $0.238 at normal exchange; present exchange greatly depreciated. Unless otherwise mentioned, the dutiable weight shall be the gross weight, less the tare allowance in percentage of gross weight, as given at the end of each tariff number according to kind of packing. The kilo is equivalent to 2.2046 pounds avoirdupois.

GERMAN IMPORT DUTIES

Tariff No.	Articles.	Rate of Duty (Gold marks per 100 kilos.)
	A—*Wares of soft india rubber:*	
570	India rubber, dissolved, with or without admixture of resin. (Gross weight)	3.00
571	Soft india rubber paste, whether or not dyed or mixed with asbestos, graphite, or other materials; rolled sheets of the same; cuttings and strips of india rubber, unmanufactured; india rubber sheets with wire or wirework rolled in—all the foregoing, not vulcanized; also gutta-percha paper. (Gross weight)	5.00
572	Cut sheets (patent sheets) of crude, refined, or dyed india rubber, mixed or not with sulphur or other materials, not vulcanized; also cuttings and strips of the same unmanufactured Tare— Cases, 8 per cent; casks, 8 per cent.	8.00
573	India rubber threads, drawn or cut: Not combined with yarns With yarns of vegetable or animal textile materials loosely wound round or plaited thereon Wound round with silk or with yarn containing silk Wound round with other yarns Tares—Cases, 16 per cent; casks, 16 per cent; baskets, 13 per cent; bales, 6 per cent.	20.00 40.00 120.00 80.00
574	India rubber tubing; For tires of vehicle wheels For stalks of artificial flowers Other kinds; india rubber tubing with an underlayer of vegetable textile materials; tubing of vegetable textile materials impregnated or coated with india rubber or with internal layers of india rubber; tubing of india rubber plaited or wound round with yarn—all these, whether combined or not with common metals or alloys thereof Tares—Cases, 13 per cent; casks, 13 per cent; baskets, 9 per cent; bales, 6 per cent.	240.00 240.00 180.00
575	Driving belts of fabrics impregnated or coated with india rubber, or with external or internal layers of india rubber; of india rubber with external or internal layers of fabrics Tares—Cases, 16 per cent; casks, 16 per cent; baskets, 13 per cent; bales, 6 per cent.	50.00
576	Wagon covers, manufactured, of coarse fabrics impregnated or coated with india rubber, or with internal layers of india rubber Tare—Cases, 16 per cent; casks, 16 per cent; baskets, 13 per cent; bales, 6 per cent.	90.00
577	Footwear of india rubber, with or without soles of other materials: Unvarnished Varnished Tare—Cases, 16 per cent; casks, 16 per cent; baskets, 13 per cent; bales, 6 per cent.	210.00 300.00
578	India rubber tires for wheels of vehicles; also covers for the same, of fabrics impregnated or coated with india rubber or with internal layers of india rubber Tare—Cases, 13 per cent; casks, 13 per cent; baskets, 9 per cent; bales, 6 per cent.	360.00
579	Wares of soft (also vulcanized) india rubber, or wares entirely or partly coated with india rubber, not otherwise mentioned, so far as they do not become liable to higher rates of duty by reason of their combination with other materials: Neither varnished, dyed, nor printed; floor-cloths of such india rubber with or without an underlayer of fabric or felt by rolling; piston packing, stuffing-box packing, and cord packing of coarse fabrics, yarn or felt, in combination with india rubber or with stearic acid, talc, tallow, or asbestos, as well as other piston and cord packing of similar quality Varnished, dyed, printed, or furnished with impressed patterns; floor cloth of such india rubber, with or without an underlayer of fabric or felt Tare—Cases, 13 per cent; casks, 13 per cent; baskets, 9 per cent; bales, 6 per cent.	40.00 120.00
580	Fabrics or felt impregnated or coated with india rubber or with internal layers of india ruber; fabrics in combination with india rubber thread; tissues of india rubber threads in combination with yarns; india rubber wares coated with fabrics or with yarns wound thereon—all these, when the fabrics or yarn consist: Wholly or partly of silk Of other textile materials Tare—Cases, 13 per cent; casks, 13 per cent; baskets, 9 per cent; bales, 6 per cent.	180.00 100.00
581	India rubber print cloths and card cloth for carding factories, with special permission and under control Tare—Cases, 13 per cent; casks, 13 per cent; baskets, 9 per cent; bales, 6 per cent.	30.00
	B—*Hardened india rubber and wares thereof:*	
582	Hardened india rubber paste, not vulcanized (gross weight)	5.00
583	Hardened india rubber paste for dental purposes, combined with color, metal powder, or other substances Tare—Cases, 11 per cent; casks, 11 per cent; bales, 2 per cent.	100.00
584	Hardened india rubber (vulcanite) in plates, bars, even if cut up, but not further worked; rough pressed goods of hardened india rubber, shaped but still showing the seams or ridges, and consequently requiring further working; unworked plates of hardened india rubber, with an underlayer of fabric or paper Tare—Cases, 11 per cent; casks, 11 per cent; bales, 2 per cent.	10.80
585	Tubes of hardened india rubber, not further worked Tare—Cases, 11 per cent; casks, 11 per cent; bales, 2 per cent.	40.00
586	Other wares of hardened india rubber combined or not with other materials, so far as they do not become liable to higher rates of duty by reason of such combination Tare—Cases, 16 per cent; casks, 18 per cent; baskets, 13 per cent; bales 6 per cent.	45.00

GENERAL NOTE: Wares of gutta percha, balata gum, or india rubber substitutes, or manufactures entirely or partly coated with these materials, so far as not specially mentioned, will be classed as india rubber wares.

TECHNICAL ABSTRACTS

Mechanical **Chemical** **Physical**

Hot Vulcanization Process

The addition of an oxidizing agent, such as sodium perborate in the proportion of from five to fifteen per cent, to rubber mixtures which contain compounds of lead, such as litharge, is recommended to avoid the blackening of the rubber mass due to the formation of the sulphide of lead in the presence of the sulphur that is employed in the vulcanization process. The rest of the operation is carried out in the usual manner and the rubber articles that are manufactured in this manner exhibit no trace of blackening or resinification. (*French Patent No. 536,733.*)

Sulphur for Vulcanization

A special sulphur preparation is made for vulcanization purposes in accordance with German Patent No. 381,422 which is assigned to the Kaban Chemische Fabrik, G.m.b.H. This product is made by passing air over a molten mass of sulphur which contains molten naphthalene of the crude pressed variety as well. The air may also be blown directly into the molten mixture, which also contains a light powdery material such as carbonate of magnesia or calcium hydroxide. After the air treatment the mass is cooled so that it solidifies in fine thread-like crystals which are then ground into a fine powder which is ready for admixture with the rubber batch.

Preservation of Rubber Latex with Ammonia

The shipping of rubber latex is preserved from the Indies to Europe and America has opened up quite a few problems for discussion and solution by experimental research. One of the first phenomena noted in the shipment of latex in this condition was that due to the same reasons the shipment would arrive in the coagulated condition in spite of the fact that ammonia had been added in the proper proportion at the point of shipment. Of course rubber latex coagulated in this condition is not worth much.

Hence the investigations which have been carried out by the well-known Dutch rubber chemist O. de Vries in conjunction with two other colleagues and which has been reported in the Comm. Central Station Rubber, Buitenzorg, 1923, No. 33, pages 1 to 31 are of interest to all rubber concerns that use or are contemplating using rubber latex.

In the first place the initial investigation was to determine what percentage of rubber was sufficient for the preservation of rubber latex under favorable conditions. It was found that 15 cubic centimeters of an aqueous solution of ammonia, specific gravity 0.9327, added to each liter of the rubber latex would suffice to preserve it. The amount of ammonia added corresponds to a quarter of a per cent of the pure alkali. In testing the alkalinity of ammonia-preserved rubber latex, methyl red was found to be a suitable indicator. Freshly preserved latex to which the aforementioned quantity of ammonia has been added, shows a proportion of 0.25 per cent ammonia when tested with methyl red as an indicator. On the other hand after the rubber latex has remained standing for a few weeks, the alkalinity was reduced to 0.22 per cent. In actual practice the proportion of ammonia used should be increased to 0.33 per cent and in certain cases to even as high as 0.5 per cent.

The causes of the reduction in the alkalinity of the preserved rubber latex have not yet been explained. But it is known that ammoniated latex undergoes other changes as well. Thus for example in the course of a few days a pale yellow deposit is formed in the ammonia-preserved rubber latex. This despit has been found to contain ammonium magnesium phosphate besides rubber and possibly other substances. Then again another precipitate is formed, this time of darker color. This dark brown mass has been identified to be ferrous sulphide. It has been discovered that hydrogen sulphide is formed during the process of decomposition of the latex but just what the character of this decomposition process is has not been ascertained.

The next phenomenon that has been observed has been the formation of a stiff, creamy layer of material containing as much as 60 per cent of the rubber in the latex. This mass of rubber-like substance is non-coherent and is not coagulated rubber but just the material that separates out by mechanical deposition without any chemical action or coagulation.

An important property of ammoniated latex is in connection with the rapidity of coagulation. When fresh latex is coagulated, quite an appreciable period of time is consumed in the process so that it is possible to introduce the acid coagulating agent uniformly before clotting begins. On the other hand when ammoniated latex which has been stored for a month or so is coagulated, it is observed that immediate coagulation takes place as soon as sufficient acid is added to overcome the alkalinity of the ammonia contained in the same. The result is that the addition of the acid coagulating agent causes the separation of clots in a milky liquid and the latter on addition of more acid yields fine flocks which do not readily unite with the clots.

Vulcanized Rubber

As filling materials for rubber, charcoal, carbon black, lamp black, clays, metal hydroxides, whiting, colloidal substances, etc., have been used in the manufacture of various kinds and grades of rubber articles. It is now found that these filling materials may be treated in such a manner so as to increase the various physical properties of the finished products. Thus, for example, the treatment of the filler serves to increase the tensile strength, the resistance to abrasion, the hardness and the toughness of the finished rubber product, while it is also possible to reduce the time of vulcanization of the same.

The preliminary treatment to which these fillers are subjected consists in the activation of the carbon by heating it to a temperature of from 400 to 1200 degrees C, or the colloidal clay by heating the latter to a temperature between 500 and 1000 degrees C. A precipitated and partly dried metallic hydroxide or a partly dried gel, such as, for example, silica gel, are activated in a similar manner as described for natural clay.

The activation removes adhering impurities from the surfaces of the particles, so that they possess an adsorptive power much greater than that of the unactivated material.

In an example a mixture of rubber 100 parts, sulphur ten parts and carbon black, which has been activiated by treating the same to a calcinating temperature of 1000 degrees C for a period of ninety minutes, 36 parts. The mixture is vulcanized at 40 pounds per square inch steam pressure for a period of three hours.

The strength of the vulcanized rubber is approximately 13 per cent higher than that of rubber containing unactivated carbon black. It has been found that there is a definite relation between the adsorption by activated carbon or clay, of malawhite green and aniline dyes such as methylene blue, aniline violet and aniline red, and the tensile strength of the finished rubber product that is obtained with the aid of such filling materials. There is also a direct relation between the amount of air given off by the carbon at a temperature of 130 to 135 degrees C and the tensile strength of the rubber, which increases with the amount of air given off. As a general rule the strength of the rubber products is increased from five to fifteen per cent, the resistance to abrasion from twenty to sixty per cent and the time of vulcanization is decreased about twenty-five per cent. (*British Patent No. 207,570.*)

RUBBER STATISTICS

Import **Production** **Export**

Comparative Summary of 1923, 1922 and 1921 Consumption of Crude Rubber in Manufacture of Rubber Products and Total Sales Value

Compiled by THE RUBBER ASSOCIATION OF AMERICA, INC.

Tires and Tire Sundries

	1923 Long Tons	1923 *Value	1922 Long Tons	1922 *Value	1921 Long Tons	1921 *Value
1—Automobile and Motor Truck Pneumatic Casings	157,523	$439,803	146,318	$423,271	88,055	$409,144
2—Automobile and Motor Truck Pneumatic Tubes	40,892	70,960	37,820	62,307	24,969	57,569
3—Motorcycle Tires (Casings & Tubes)	394	1,540	428	1,582	144	1,109
4—Bicycle Tires (Single Tubes Casings and Tubes)	1,210	4,309	898	3,533	534	3,091
5—All other Pneumatic Casings and Tubes, not otherwise specified	18	129	529	2,258	455	2,049
6—Solid Tires for Motor Vehicles	18,305	29,630	18,570	27,877	8,798	21,411
7—All other Solid Tires	302	775	352	1,027	185	1,251
8—Tire Sundries and Repair Materials	2,308	11,317	2,288	10,338	1,979	10,837
Total—Tires and Tire Sundries	220,952	558,463	207,203	532,193	125,119	506,461

Other Rubber Products

9—Mechanical Rubber Goods	16,076	84,859	15,603	68,970	9,723	61,498
10—Boots and Shoes	16,204	123,631	11,985	102,688	10,602	91,086
11—Insulating Wire and Insulating Compounds	3,319	32,076	2,198	21,955	1,048	11,717
12—Druggists Sundries, Medical and Surgical Rubber Goods	2,358	13,052	2,492	12,290	1,365	11,233
13—Waterproof Cloth, Clothing and Rubber Sheeting	3,052	24,030	2,669	16,134	1,531	13,259
14—Hard Rubber Goods	2,807	9,822	2,278	8,256	957	4,285
15—Heels and Soles	5,082	16,882	5,938	18,762	**1,788	**7,444
16—Miscellaneous, not included in any of above items	5,106	20,625	3,817	13,837	2,156	12,764
Total—Other Rubber Products	54,004	324,957	46,980	262,892	29,170	213,286
GRAND TOTAL ALL PRODUCTS	274,956	$883,420	254,183	$795,085	154,289	$719,747

* 000 omitted

** Included in Mechanical Rubber Goods for first half of 1921.

	1923	1922	1921
Average number of manufacturers reporting	243	240	237
Average number of employees	153,044	139,806	121,642

Crude Rubber Inventory

	1923	1922	1921
Total Inventory of Crude Ruber on hand and afloat, Dec. 31:			
Plantation	104,078	127,232	113,553
Para	4,189	6,138	5,588
All other	1,118	2,169	10,618
TOTAL	109,385	135,539	129,759

Production and Consumption of Reclaimed Rubber

Tons of Reclaimed Rubber Produced	69,534	53,788	34,156
Tons of Scrap Rubber consumed	88,008	68,844	46,036

Shipments of Rubber Manufactures from the United States to Non-Contiguous Territories During the Month of January, 1924

		Alaska Quantity	*Alaska* Dollars	*Hawaii* Quantity	*Hawaii* Dollars	*Porto Rico* Quantity	*Porto Rico* Dollars
Boots and Shoes	(Pairs)	....	....	177	183	11,199	7,727
Canvas Shoes with Rubber Soles	(Pairs)	4,318	9,046	6,225	8,886	36,965	26,165
Druggists' Rubber Sundries	(Pounds)	....	....	1,610	1,296	1,340	998
Automobile Casings	(Number)	71	1,220	9,011	122,598	2,574	41,245
Automobile Inner Tubes	(Number)	69	236	8,441	17,691	4,088	8,476
Other Tires	(Number)	....	....	603	1,382	300	593
Belting, Hose, and Packing	(Pounds)	7,403	3,783	41,041	16,436	8,297	3,060
Other rubber manufactures	(Pounds)	1,389	653	20,622	10,315	12,241	4,639
Coated and waterproofed goods	(Pounds)	8,720	5,622	18,835	13,946	3,102	3,379

Exports of Rubber Goods from U. S.—January, 1924

Compiled by the Department of Commerce

RUBBER BELTING, HOSE, PACKING, AND THREAD.

	Rubber Belting Pounds	Rubber Belting Dollars	Rubber Hose Pounds	Rubber Hose Dollars	Rubber Packing Pounds	Rubber Packing Dollars	Rubber Thread Pounds	Rubber Thread Dollars
Totals	252,233	148,139	433,396	169,472	156,458	69,435	73,370	83,802

PNEUMATIC CASINGS AND PNEUMATIC TUBES

	Pneumatic Casings: For automobiles Number	Pneumatic Casings: For automobiles Dollars	Pneumatic Casings: Other Number	Pneumatic Casings: Other Dollars	Pneumatic Tubes: Automobiles Number	Pneumatic Tubes: Automobiles Dollars	Pneumatic Tubes: Other Pounds	Pneumatic Tubes: Other Dollars
Totals	72,426	866,651	4,132	20,094	76,091	138,753	3,534	3,129

HARD RUBBER GOODS

	Battery jars and Accessories Pounds	Battery jars and Accessories Dollars	Other Electrical Supplies Pounds	Other Electrical Supplies Dollars	Other hard rubber goods Pounds	Other hard rubber goods Dollars
Totals	13,812	4,828	15,541	9,578	24,635	29,846

WATERPROOFED AUTOCLOTH, RUBBERIZED FABRICS, ETC.

	Waterproofed Autocloth and Rubberizer Fabrics Sq. yards	Waterproofed Autocloth and Rubberizer Fabrics Dollars	Waterproofed Clothing Pounds	Waterproofed Clothing Dollars
Totals	142,587	84,614	43,075	42,700

SOLID TIRES, ACCESSORIES AND REPAIR MATERIALS

	Solid Tires: For Automobiles and Motor Trucks Number	Solid Tires: For Automobiles and Motor Trucks Dollars	Solid Tires: Other Number	Solid Tires: Other Dollars	Accessories and Repair Materials Pounds	Accessories and Repair Materials Dollars
Totals	9,779	325,487	92,958	25,160	64,848	23,144

RUBBER FOOTWEAR AND SOLES AND HEELS.

	Boots Pairs	Boots Dollars	Shoes Pairs	Shoes Dollars	Canvas shoes with rubber soles Pairs	Canvas shoes with rubber soles Dollars	Rubber soles and heels Pounds	Rubber soles and heels Dollars
Totals	45,885	106,451	108,224	98,994	190,723	153,647	159,531	50,325

MARKETS

Cottons and Fabrics

NEW YORK, March 1, 1924

Since our last report, cotton has reached a new low for this year, declines of 8 to 9 cents per pound being recorded. Temporary rallies were followed by declines to lower levels and each decline brought additional buyers. Whereas two weeks ago closing was at 31.78 and 33.07 a month ago, yesterday's price was 28.88 for March delivery. This is a decline of 419 points in a month and the bottom evidently has not been reached.

The reasons for these fluctuations are many and it is hard to say just which figured most prominently. Weakness in cotton goods has caused a difficulty in working off stocks according to a number of mills. These mills are reported to be curtailing operations and such a reduction naturally was reflected in raw cotton prices.

Effect of Washington Scandal

The stock market in general has been affected by the disclosures in the oil inquiry in Washington and the declines in stocks had reacted on the cotton market. Uneasiness in general stocks and industrial securities as a rule is reflected in the raw products markets and cotton has been no exception.

A weak foreign market with reports of probable closing down of English mills brought buyers into the market who took advantage of the lower quotations during the middle of the month. Contract prices in Liverpool did not help relieve local apprehension of the pending census report and spot quotations on February 16 were reduced about 75 points, with May selling at 32 cents.

The decline was temporarily halted a few days later when prices reached the 30 cent level. March sold at 29.75 and May at 30.10, a loss of 7 cents from the prices of last November. Buyers were naturally attracted and there was considerable buying for trade and speculative account. This caused a slight recovery on February 19. More encouraging advices were received from Manchester and a better spot demand was reported from the South. The above upward movement continued for a short while, during which time buying was increased. However as selling became less active, offerings immediately increased and later prices broke sharply. Better Southern demand and a belief that speculative long accounts in futures had been liquidated caused a better feeling.

Further Declines

On Feb. 23 unfavorable weather advices from the South caused apprehension and business was restricted. Declines were reported. The past week saw a continuation of the declines of the previous seven days. A renewal of liquidation caused a break of 85 to 100 points with May contracts selling at 29.45. The delay in the issuance of the Government statistical report has been a disappointment to the trade and was one reason for some of the liquidation of recent buyers.

A slight rally occurred on Tuesday of this week but was short-lived, with declines of 10 to 66 points being recorded, March selling for 28.70 and May at 29.00. It is still felt that prices will have to go lower before cotton goods can be sold at a profit for price cuts were announced by several mills which hardly allowed for any profits. A broader demand in the middle of the week brought higher quotations with May closing at 30 cents and the old crop up 27 to 52 points. Mill inquiry was good and Southern spinners were reported to be acquiring new lines of raw materials. Uncertainties of weather and planting conditions widened the spread between old and new crops.

Yesterday saw a renewal of heavy general selling and prices broke more than a cent a pound. A bearish sentiment dominates trading while uncertainty persists over the future. A threat of a lockout of Lancashire operatives started the renewal of downward trend and May deliveries sold at 29.08. Lower prices are expected.

The range of prices follow:

	Open.	High.	Low.	Feb. 14	Feb. 29
March	29.82	29.83	28.83	31.78-84	28.88-91
May	30.15	30.22	29.08	32.05-10	29.15-22
July	29.35	29.41	28.45	30.52-55	28.48-55
October	26.23	26.30	25.82	27.20	28.85-T
December	25.89	25.89	25.45	26.75	25.45-T

EXTRA STAPLE COTTON

Though sales were in small lots at close prices, extra staples have recently been active with inquiries reported on an increase. Anxiety for liquidation of Southern stocks has given rise to price cutting in certain types while other types are demanding a premium. Some demand is for spots but mills seem to be well supplied with stocks. The largest movement and interest has been in Egyptians which have broken sharply in sympathy with domestic cotton. Exports from Alexandria show an increase with arrivals from the interior falling off, resulting in a steadily decreasing stock of available supplies. Domestic extra staple have declined in prices and offerings are about normal.

Prices on extra staple cotton, strict middling in grade and color, f.o.b., New Bedford, were quoted today as follows:

1 1-8 inch, 33 @ 33½ cents.
1 3-16 inch, 33½ @ 34 cents.
1 1-4 inch, 34 @ 35 cents.
1 5-16 inch, 36½ cents upward.

TIRE FABRICS

Trading has been only fair when the activity of tire plants is considered. Fabric mills predict an improvement in demand shortly for tire manufacturers have not covered their requirements very fully as yet. Stocks have been changing hands lately at prices which were quite advantageous to the manufacturers. It is reported that one Akron company has contracted for 500,000 pounds of fabric of which 75% is square woven. Prices quoted are somewhat lower than in our last report, and are as follows:

CORD FABRICS

Combed Sakellarides		**Nominal**	
Combed Peeler	lb.	Nominal	
Carded Peeler	lb.	.57 @	.59
Combed Egyptian uppers	lb.	Nominal	
Carded Egyptian uppers	lb.	.62 @	.63

SQUARE WOVEN

17¼-ounce Egyptian uppers, combed	lb.	**Nominal**	
17¼-ounce Egyptian uppers, carded	lb.	.60 @	.62
17¼-ounce Sakellarides, combed	lb.	**Nominal**	
17¼-ounce Peeler, combed	lb.	**Nominal**	
17¼-ounce Peeler, carded	lb.	.56 @	.58

Burlaps—Market has been comparatively quiet until the last few days when an improved demand was noted on receipt of higher cables from Calcutta. As a result some trading was done in spot and nearby afloat positions. A slight increase in the past week was noted in 10½ oz. from 7.75 to 8.00 cents.

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Quotations on sheetings, ducks, drills and osnaburgs have decreased materially within the past week. Some items are lowered as much as 3 cents and a few even more. However, even at these lower quotations sales have not been great. Buyer's ideas still seem to be greatly under those of sellers on prices. What movement has taken place has largely been in small lots only. The cotton situation is being watched and the trade can't make out what the future holds in store. Some look for cotton to go even lower and a lot of talk is heard of mill curtailment, which if true, will probably bring prices still lower.

SHEETINGS

40-inch 2.50-yard	yd.	.17 @	.17¼
40-inch 2.85-yard	yd.	.14½ @	.14¾
40-inch 3.15-yard	yd.	.16 @	—
40-inch 3.60-yard	yd.	.13 @	.13¼
40-inch 3.75-yard	yd.	.12¼ @	.12½
40-inch 4.25-yard	yd.	.10¼ @	—

DUCKS

Belting	lb.	.49 @	.51
Hose	lb.	.47 @	.51
Enameling	lb.	.50 @	.56
Shoe Ducks	lb.	.40 @	.53
Single filling	lb.	.22 @	.24
Double filling	lb.	.23 @	.26

(Continued on Page 427)

Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET—NEW YORK, March 3, 1924—In general, the market for industrial chemicals outside of the rubber industry has shown a decided slump compared with the previous few weeks, but as far as the rubber industry is concerned no such feeling is shown. All makers seem to be reporting very good business with the demand from rubber manufacturers continuing very satisfactorily. One firm whose business is among the largest in the industry is hardly able to fill customers' requirements and all report a very healthy condition. Factories, especially tires and mechanical goods, are working at capacity with no let-up in sight for a few weeks. A few advances were recorded but in the main the market is firm and steady. An over-production of carbon black is noted but it is not serious enough to be reflected in the price quotations as yet.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .90 @	.95
Aniline oil, drums	lb.	.17 @	.17½
Diphenylguanidine	lb.	1.05 @	1.20
Excellerex,	lb.	.40 @	.45
Formaldehyde-Aniline	lb.	.47½ @	—
Hexamethylene-tetramine	lb.	.75 @	.80
Paraphenylenediamine	lb.	1.40 @	1.50
Super-Sulphur No. 1	lb.	.50 @	.60
Super-Sulphur No. 2	lb.	.25 @	.35
Tetramethyl—Thiuramdisulphide	lb.	6.00 @	—
Thiocarbanilide, kegs	lb.	.26½ @	—
Vulcocene	lb.	.35 @	—

Inorganic

Lead, sublimed blue	lb.	.09¼ @	—
Lead, white	lb.	.09 @	.09½
Litharge, domestic	lb.	.11½ @	—
Lime, Superfine	lb.	.01½ @	.03½
Magnesia, calcined, light,	lb.	.23 @	.24
extra light	lb.	.45 @	.60
heavy	lb.	.05½ @	.06½

COLORS

Blacks			
Arrow, "Aerfloted"	lb.	.09½ @	.10½
Bone Black	lb.	.05½ @	.07½
Carbon "	lb.	.07½ @	.09½
Drop "	lb.	.07½ @	.10
Ivory "	lb.	.15 @	.45
Lamp "	lb.	.12 @	.40
Micronex	lb.	.09 @	.14
Blues			
Cobalt	lb.	.21 @	.23½
Prussian	lb.	.40 @	.43
Ultramarine	lb.	.08 @	.35
Browns			
Iron oxide	lb.	.04½ @	.06½
Sienna, Italian,	lb.	.06 @	.14½
Umber, Turkey,	lb.	.04 @	—
Vandyke, domestic	lb.	.03½ @	.04
Greens			
Chrome, light	lb.	.28 @	.31
medium	lb.	.30 @	.35
dark	lb.	.32 @	.42
Commercial	lb.	.12 @	—
Reds			
Antimony crimson, 15/17% F.S.	lb.	.39 @	.55
sulphur free	lb.	.39 @	.50
golden, 15/17% F.S.	lb.	.20 @	.22
calcium and sulphur free	lb.	.40 @	—
red sulphuret 15/17% F.S.	lb.	.15 @	.16
Indian, English	lb.	.11 @	.13
Para toner	lb.	1.00 @	1.10
commercial	lb.	.16 @	.18
Red Oxide, reduced	lb.	.08 @	.12
pure	lb.	.12 @	.14
Toluidine toner	lb.	2.10 @	2.25
Venetian red	lb.	.03½ @	.06
Vermillion, quicksilver, English	lb.	1.20 @	—
domestic	lb.	.25 @	.30
Whites			
Albalith	lb.	.07 @	.07½
Aluminum bronze	lb.	.55 @	.60
Lithopone, domestic	lb.	.06¾ @	.07
Azolith	lb.	.06½ @	.07
Zinc Oxide—American Process XX red	lb.	.07⅞ @	.08⅛
Kadox, black label, bags, cars		.09¾ @	—
blue " " "		.09½ @	—
red " " "		.09¼ @	—
American Azo: ZZZ (lead free)	lb.	.07¾ @	.08¼
ZZ (under 5 per cent leaded)	lb.	.07 @	.07½
Z (8-10 per cent leaded)	lb.	.06¾ @	.07¼
Zinc Oxide—French Process White seal	lb.	.12 @	.12¼
Green seal	lb.	.10¾ @	.11¼
Red seal	lb.	.09¾ @	.10¼
Yellows			
Chrome, light		.18½ @	.19
dark and medium	lb.	.18½ @	.19
Cadmium Sulphide	lb.	1.75 @	2.50
Ocher, French	lb.	.01¾ @	.03
domestic	lb.	.02¼ @	.03

COMPOUNDING INGREDIENTS

Aluminum	ton	25.00 @	40.00
hydrate light	lb.	.17½ @	.18½
Ammonia carbonate,	lb.	.09¼ @	.10½
Barium carbonate,	ton	63.00 @	70.00
Barium Dust	lb.	.05 @	.06
Barytes southern off-color,	ton	15.00 @	18.00
Western, prime white	ton	22.00 @	23.00
Imported	ton	30.00 @	35.00
Basofor	lb.	.04¼ @	—
Blanc fixe, dry f.o.b. works	lb.	.04¼ @	—
Carrara filler	lb.	.01½ @	.02
Chalk, precipitated, extra light	lb.	.04¼ @	.05
heavy	lb.	.03¼ @	.04
Clay, China, domestic,	ton	15.00 @	16.50
Dixie	ton	22.00 @	32.00
Blue Ridge	ton	12.00 @	25.00
Fossil flour	lb.	.03 @	.05
Glues, extra white	lb.	.30 @	.40
medium white	lb.	.20 @	.26
cabinet	lb.	.18 @	.28
cabinet low grade	lb.	.15 @	.18
common bone	lb.	.11 @	.15
Graphite flake, bbls.	lb.	.06½ @	.12
amorphous	lb.	.04 @	.10
Infusorial earth, powdered	ton	60.00 @	—
bolted	ton	70.00 @	—
Liquid latex	gal.	1.25 @	1.35
Magnesia, carbonate	lb.	.08½ @	.09
Mica, powdered	lb.	.10 @	.15
Rotten Stone (powdered)	lb.	.02½ @	.04½
Soapstone, powdered	ton	15.00 @	20.00
Starch, powdered	cwt.	3.27 @	3.54
Talc, domestic	ton	15.00 @	18.00
French	ton	20.00 @	—
French, high grade	ton	40.00 @	—
Italian	ton	47.00 @	58.00
Terra Alba	cwt.	1.85 @	2.00
Tripoli, white	lb.	.02 @	.02¼
Whiting, commercial	cwt.	1.00 @	—
domestic	cwt.	13.00 @	15.00
gilder's bolted	cwt.	1.10 @	—
English cliffstone	cwt.	1.50 @	—
Paris white American	cwt.	1.25 @	—
Quaker	ton	13.00 @	15.00
Sussex	ton	8.00 @	16.00
Wood pulp XXX	ton	35.00 @	—
" " X	ton	25.00 @	—

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Granulated M.R.	ton	33.00 @	54.00
Hard hydrocarbon	ton	30.00 @	40.00
Soft hydrocarbon	ton	30.00 @	40.00
320/340 M. P. hydrocarbon (c. l. factory)	ton	45.00 @	50.00
300/310 M. P. hydrocarbon (c.l. factory)	ton	.40.00 @	45.00
Synpro, granulated, M. R. (factory)	ton	55.00 @	70.00

SOFTENERS

Acids			
Acetic, 28 per cent	cwt.	3.38 @	3.63
Cresylic, 97%	gal.	.73 @	.85
95%	gal.	.68 @	.80
Muriatic, 20%	cwt.	.95 @	1.05
Nitric, 36 degrees	cwt.	4.00 @	4.50
Sulphuric, 60 degrees	ton	10.00 @	12.00
66 degrees	ton	14.00 @	16.00
Tartaric, crystals	lb.	.30 @	—
Alkalies			
Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58%	cwt.	2.04 @	2.19
Oils			
Castor, No. 3, bbls.	lb.	.15 @	—
Chinawood, bbls.	lb.	.17½ @	.18
Corn, crude, bbls.	lb.	.10¾ @	.11½
refined	lb.	.12¾ @	.13
Cottonseed, crude		8.87 @	9.00
Glycerine,	lb.	.16½ @	.17
Linseed, domestic	gal.	.88 @	1.00
Palm, Niger	lb.	.07 @	—
Lagos	lb.	.07¾ @	.08
Peanut,domestic,crude	lb.	.13 @	—
Petroleum, amber	lb.	.04¼ @	—
dark, amber	lb.	.04 @	—
Pine, steam distilled	lb.	.65 @	.70
Rapeseed, refined	gal.	.92 @	—
blown	gal.	1.05 @	—
Rosin, first rectified	gal.	.43 @	.45
second refined	gal.	.46 @	.47
Soya Bean		.10¼ @	.12½
Tar, commercial	gal.	.30 @	—
Resins and Pitches			
Cumar resin, hard	lb.	.09 @	.10
soft	lb.	.09 @	.10
Parra M.R.	lb.	.06 @	.07
Tar Retort	bbl.	11.00 @	—
kiln burned	bbl.	11.00 @	—
Pitch, Burgundy	lb.	.05 @	.06
coal tar	gal.	.06 @	.08
pine	bbl.	6.50 @	—
Rosin, grade K	bbl.	5.90 @	—
Shellac, fine orange	lb.	.61 @	.62
Solvents			
Acetone, drums	lb.	.19 @	.20
Alcohol, denatured, No. 1 bbls.	gal.	.52½ @	.56½
Benzol, 90%	gal.	.21 @	.26
pure		.23 @	.28
Carbon bisulphide	lb.	.06 @	.07
Tetrachloride	lb.	.08¼ @	.09
Dimethylaniline	lb.	.39 @	.41
Motor gasoline, steel bbls.	gal.	.20 @	—
Naptha, V. M. & P.	gal.	.19 @	—
Toluene	gal.	.31 @	.36
Turpentine, spirits	gal.	1.01 @	1.02
wood	gal.	.90 @	.92
Waxes			
Bayberry	lb.	.25 @	.26
Beeswax	lb.	.40 @	.42
Carnauba, No. 1	lb.	.37 @	.38
Ceresin, white	lb.	.09 @	.10
Montan, crude	lb.	.06 @	.06½
Ozokerite, black	lb.	.23 @	.24
green	lb.	.27 @	.28
Paraffine	lb.	.04¼ @	.04¾
Phenol	lb.	25 @	.26
Sweet wax	lb.	.10 @	.12

SUBSTITUTES

Black	lb.	.09 @	.14
White	lb.	.10 @	.16
Brown	lb.	.10 @	.15
Brown factice	lb.	.09½ @	.13
White factice	lb.	.08½ @	.15

VULCANIZING INGREDIENTS

Black hyposulphite	lb.	.20 @	.25
Sulphur Chloride (drums)	lb.	.04 @	.05
Sulphur flour			
Commercial bags,	cwt.	1.35 @	—
" bbls.	cwt.	1.70 @	—
Superfine, bags,	cwt.	2.00 @	—
" bbls.	cwt.	2.40 @	—
100% pure, refined, bags	cwt.	2.35 @	—
bbls.	cwt.	2.60 @	—

Chemicals

Acetic Acid—The market is steady with some buying on a broader scale reported The raw material market is not as stable as it has been but present prices are maintained at $3.38 @ 3.63 for 28%.

Nitric Acid—Competition and excessive stocks have resulted in a 50 cent decline in nitric, now being quoted at $4.00 @ 4.50 per cwt.

Carbon Black—A rising market was reported in some quarters with a consequent fall in demand but although it is said that there is an overproduction of blacks due to new producing units, producers maintain that a very active market exists in the rubber industry. Movements of stocks have been very satisfactory with the market firm and getting stronger in some items on the list. Prices quoted are still .07½ @ .09½ ofr carbon black and .05½ @ .07½ for bone. A rise is predicted in some quarters.

Litharge—An advance in lead has caused increased prices for litharge. The raw material market is firm as is also the market for the litharge. Demand continues active. Domestic is now quoted at 11½ cents a pound.

Lithopone—A steady market is reported with demand in the rubber industry at a high point. Some producers are sold ahead for several weeks and are not accepting new business. Prices are .06⅜ @ .07 cents a pound.

Zinc Oxide—Producers report a very good business at this time with prices unchanged. The market is firm.

Scrap Rubber

NEW YORK, March 5, 1924

Stocks of scrap are not moving very rapidly at this time. Bad weather has made it difficult to handle stocks in dealer's yards with the result that they are holding on until milder weather before releasing them. Prices are low and what little trading has been done has been at low prices.

It had been expected that quotations would be lower later in the Spring and that present prices would hold for some time but the low prices of 24⅛ cents quoted on crude rubber yesterday and the large resultant buying will probably bring a lessening of demand for scrap and a decided drop within a few days. Quotations are as follows:

Auto tire peelings		.00⅞ @	.01
Standard White auto	ton	18.00 @	20.00
Mixed auto	ton	12.00 @	13.00
Bicycle tires	ton	7.00 @	8.00
Clean solid truck tires		.00⅞ @	.01
Boots and shoes		.02¼ @	.02⅜
Arctics, untrimmed		.01¼ @	.01⅜
Arctics, trimmed		.01⅝ @	.01¾
Inner tubes, No. 1		.03⅛ @	.03⅝
Inner tubes, compounded		.02⅜ @	.02½
Inner tubes, red		.02¼ @	.02⅜
Battery jars, clean hard rubber		.01 @	.01¼
Air Brake Hose	ton	10.00 @	12.00
Red packing		.01 @	.01¼
White druggist sundries		.01½ @	—
Rubber Hose	ton	9.00 @	10.00

CRUDE RUBBER REACHES NEW LOW

NEW YORK. March 5, 1924—A steady decline in the last few days in crude brought the price of spot smoked ribbed sheets down to 24 1/8 cents, a point not touched for over a year. This weakness has been largely brought about by a lack of buying support from rubber manufacturers and not to any great extent by the reports of any failure of Dutch planters to cooperate on restriction. Nothing definite has been decided in this matter according to the trade and the present decline is largely due to local inactivity.

Reclaimed Rubber

NEW YORK, March 1, 1924

Activity in reclaims continues satisfactory. Factories are working in many cases at full capacity and demand is very good. There has been a large movement of stock during February and reclaimers are optimistic. Prices have changed but slightly and are quoted as follows:

Floating Tube	.15¼ @	.15½
Friction	.22½ @	.23½
Boots and Shoes (unwashed)	.09¾ @	.10¼
Boots and Shoes (washed)	.13 @	.13¼
Mechanical	.09½ @	.10½
Hose	.10 @	.11
Tires, truck	.08¼ @	.08¾
Tires, auto, black	.08¾ @	.09¼
Black (washed)	.11 @	.11¼
White	.15 @	.15½
Dark Gray	.09¾ @	.10¼
Light Gray	.11 @	.11¼

Cotton Markets

(Continued from Page 425)

BURLAPS
(Carload Lots)

7½-ounce	40-inch	5.75 @	5.80
8 -ounce	40-inch	5.60 @	5.85
10 -ounce	40-inch	7.65 @	7.95
10½-ounce	40-inch	7.60 @	8.00

DRILLS

37-inch	2.75-yard yd.	.14¾ @	.15
37-inch	3.00-yard yd.	.14 @	.14½
37-inch,	3.25-yard yd.	.13½ @	.13¾
37-inch	3.50-yard yd.	.13½ @	—
37-inch	3.95-yard yd.	.10¾ @	.11

OSNABURGS

30-inch	7-ounce	.15¾ @	.16½
40-inch	7-ounce	.16¾ @	.17¼

Crude Rubber

NEW YORK, March 1, 1924

Local trading has been exceedingly limited during the past two weeks. Whether this has been due to reports of Dutch interest in restriction, increase of stocks in British ports as a result of the dock strike or just to natural inclination of buyers to wait before buying is hard to say. For a while, the continued reports that Dutch planters had agreed to cooperate with the British on restriction brought quotations up about ⅝ cents but when this report was unverified by later cables, the price immediately dropped ⅜. Inquiries in the trade have failed to bring forth any definite information on the Dutch matter and any action resulting from recent meetings with British planters is being held back.

However, buyers in the local market have been very wary of any purchases other than spots, and these in limited quantities only. Very little real trading has been done, the rubber plants seemingly being content to buy in hand-to-mouth fashion. In some quarters there seems to be an impression that prices of crude will be forced still lower very shortly. What such an impression is based on is difficult to conjecture as indications would seem to tend otherwise but shrewd rubber buyers evidently are awaiting something of this sort, with the result that prices have shown a slight downward tendency since our last report.

Ribbed smoked sheets, spot, are quoted at 25¼c. and April-June at 25¾ whereas this same position was quoted at 26⅛c. two weeks ago. The London and Singapore markets have fluctuated fractionally but for the last few days have been very steady and unchanged. The lower grades have been very quiet. Prices are as follows at this date:

NEW YORK MARKET

Plantations—		
Ribbed Smoked Sheets:		
Spot	.25¼ @	—
March	.25¼ @	—
April	.25½ @	—
April-June	.25¾ @	—
July-September	.26¼ @	—
First Latex, crepe, spot	.25⅝ @	—
Amber Crepe No. 1 ,spot	.24⅞ @	—
" " No. 2,	.24⅝ @	—
" " No. 3,	.24⅓ @	—
" " No. 4,	.24⅛ @	—
Brown Crepe, Rolled	.24⅝ @	—
" " Clean, thin	.24 @	—
" " Specky	.23¾ @	—
Scrap, Colombo No. 1	.21 @	—
Pontianac—		
Prime Pressed	.13 @	.14
Palembang	nominal	
Bangermassin	.09 @	—
Sarawak	.07¾ @	—
Paras—		
Up-river Fine	.21 @	—
" Medium	.20 @	—
" Coarse	.17½ @	—
Islands, fine	.18½ @	—
" medium	nominal	
" coarse	.11½ @	nom.
Cameta	.12 @	nom.
Madeira Fine	.22½ @	—
Acre Bolivian, fine	.21 @	—
Cut Beni Bolivian, fine	.22 @	—
Tapajos, fine	.19¼ @	—
Xingu Ball	.18 @	—
Caucho Ball—		
Upper, shipment	.19½ @	—
Centrals—		
Central, scrap, prime	.17 @	—
Corinto, scrap	.17¼ @	—
Esmeralda, sausage	.17½ @	—
Guayule, w and d.	.24 @	—
Africans—		
Benzuela, No. 1	.16 @	—
" No. 2	.15 @	—
Congo, upper, black	.21 @	—
" " red	.21 @	—
Balata—		
Block, Colombia	.65 @	—
" Venezuela	.71 @	—
" Cindad	.75 @	—
Surinam, sheet	.77 @	—
Gutta Percha—		
Siak	.18¾ @	.19
Red Macassar	2.50 @	2.75
Chicle—		
Honduras	.60 @	.64
Mexican, Yucatan	.67 @	.68

LONDON MARKET

Standard Ribbed Smoked Sheets—	
Spot	13⅝d
Mar.	13⅝
Apr.-June	14
July-Sept.	14½

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—	
Spot	13⅛d
Mar.	13¼
Apr.-June	13½
July-Sept.	13⅞

Rubber Patents

GRANTED FEBRUARY 12, 1924

1,483,113. Heel Trimming Machine. LeRoy W. Rollins, Medford, Mass., assignor to United Shoe Machinery Corpn., Paterson, N. J., a Corporation of New Jersey.

1,483,150. Toy Balloon. Arthur P. Witten, Akron, Ohio.

1,483,165. Practice Golf Ball. Washington Libbey Eaton, Holyoke, Mass.

1,483,192. Elastic Belt. George Langgons, Brooklyn, New York.

1,483,261. Garment Supporter. Alfred M. Ziegler, Newton, Mass.

1,483,262. Garment Supporter. Alfred M. Siegler, Newton, Mass.

1,483,297. Tire Building Apparatus. Henry R. Gilson, New Rochelle, N. Y., assignor to Revere Rubber Company, a Corporation of Rhode Island.

1,483,351. Suspensory Bandage. Charles S. Keirstead, Andover, Mass.

1,483,374. Tire Valve. Frederick V. Pepper, Los Angeles, California.

1,483,543. Tire Alarm. Ivan Best, Morland, Kansas.

1,483,578. Fan Belt. Robert L. GoodBar, Minneapolis, Minn., assignor to GoodBar Rubber Company, Minneapolis, Minn., a Corporation of Minnesota.

1,483,664. Machine for Removing Thin Rubber Articles from Forms. John A. Kempel, Coventry Township, Summit County, Ohio.

1,483,701. Tire Gage. Otto Weber, Manteno, Illinois.

1,483,773. Antiskid Wear-Resisting Armor for Tires. Harry S. Brickell, deceased, late of Pittsburgh, Pa.; by Emma D. Brickell, executrix, Pittsburgh, Pa., assignor to said Emma D. Brickell, Pittsburgh, Pa.

1,483,782. Storm Gaiter. William C. Cole, Canonsburg, Pa.

1,483,841. Rim Tool. Dallas C. Carroll, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio, a Corporation of Ohio.

1,483,856. Method of Manufacturing Rubberized Fiber Composition. Paul Beebe, Akron, Ohio, assignor to the Goodyear Tire & Rubber Company, Akron, Ohio, a Corporation of Ohio.

1,483,857. Mold. James D. Fitzharris, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio, a Corporation of Ohio.

GRANTED FEBRUARY 19, 1924

1,483,915. Tire-Boot-Building Machine. Charles W. Steele, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio, a Corporation of Ohio.

1,483,957. Pencil Eraser. Nils T. Trygge, Chicago, Ill.

1,484,037. Cushion Tire. Alexander Hope Ratterree, Charlotte, N. C.

1,484,068. Pressure Gage. Frank H. Hopkins, Somerville, Mass., assignor by mesne assignments, to American Schaeffer & Budenberg Corpn., Brooklyn, N. Y., a corporation of New York.

1,484,299. Core. John B. Davies, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio, a Corporation of Ohio.

1,484,407. Air Bag for use in the manufacture of Pneumatic Tires. John Fullerton Palmer, St. Joseph, Mich.

1,484,456. Tire-Building Machine. John Axel Ahlfors, Canton, Ohio, assignor to The Knight Manufacturing Co., Canton, Ohio, a Corporation of Ohio.

1,484,535. Vehicle Wheel. John W. Shepard, Tucson, Arizona.

1,484,573. Valve-Stem Washer, Lewis Clyde Sharpe, Kerrville, Texas.

1,484,588. Demountable Rim. Joseph E. Trojan, Columbus, Texas.

1,484,593. Demountable Rim Pulley. James Walters, Birmingham, Ala.

1,484,598. Fabric Cutter. Frank S. Weniger, Binghamton, N. Y., assignor to Peters Bros. Rubber Co., New York, N. Y., a Corporation of New York.

Trade Marks

FEBRUARY 12, 1924

(Subject to opposition within 30 days of above date)

DELLEX—No. 181,515. Frances Florence Dell, London, England. Table mats made of net or lace, with heat insulators inside, the predominating material being vulcanized plantation crepe (vulcanized rubber).

SUREFIT—No. 181,622. Smaltz-Goodwin Company, Philadelphia, Pa. Shoes made of leather, fabric and combinations of leather and fabric, leather and rubber and fabric and rubber.

CONTE—No. 181,650. Societe Anonyme "Crayons Conte," Regny and Paris, France. Rubber erasers, rubber bands.

CONTE A PARIS—No. 181,651. Societe Anonyme "Crayons Conte," Regny and Paris, France. Rubber erasers and rubber bands.

PIONEER—No. 187,958. The Pioneer Rubber Company, Willard, Ohio. Game balls and the rubber bladders therefor.

RESEARCH—No. 188,430. Research Club, Inc., Chicago, Ill. Tire Tape.

REPRESENTATION of wheel across the spokes of which appear a book and a microscope.—No. 188,431. Research Club, Inc., Chicago, Illinois. Tire tape.

ZEV—No. 188,979. The Union Rubber Company, Zelienople, Pa. Automobile rubber tires and tubes of rubber, fabric and combinations of the same.

(Not subject to opposition.)

INLAND—No. 179,767. Inland Rubber Company, Chicago, Ill. Automobile rubber tires.

FEBRUARY 19, 1924

SMART SET—No. 170,639. Goldenberg's, Washington, D. C. Rubber buttons.

LANSBURGH & BRO.—No. 173,893. Lansburgh & Bro. Inc., Washington, D. C. Rubber buttons.

HAMMER—No. 180,932. Ingersoll-Rand Company, Jersey City, N. J. Hose composed of rubber and fabric.

VULCALYNE—No. 181,875. Vulcalyne Company, Los Angeles, Calif. Composition of matter for Metal-Coating Rubber.

SAFETY FIRST—No. 183,075. The Mason Tire & Rubber Company, Kent, Ohio. Rubber tire casings.

ROUND TRIP—No. 187,309. Eugene E. Graves, doing business as The Round Trip Auto Lug Company, Lincoln, Nebraska. Automobile accessories—namely, mud lugs, tire chains, repair links and clamps for securing tire patches.

KENWAY—No. 187,821. C. Kenyon Company, Inc., Brooklyn, N. Y. Rubber tires and tubes.

TAURUS—No. 188,119. Hungarian Rubber Goods Factory, Ltd., Budapest, Hungary. Soles and heels made of leather or rubber.

BRO-SE-CO—No. 188,737. Brown & Sehler Company, Grand Rapids, Michigan. Automobile tires including tire casings and inner tubes therefor.

CROSSTOWN—No. 188,850. The McLean Tire & Rubber Company, East Liverpool, Ohio. Tires, casings, inner tubes, tire patches. Made of rubber or rubberized fabric.

CHECKER CORD—No. 189,134. Original Tire Company, Cincinnati, Ohio. Tires and inner tubes composed of rubber fabric or rubber and fabric.

MASSASOIT—No. 189,395. The Fisk Rubber Company, doing business as Massasoit Rubber Works, Chicopee Falls, Mass. For Tires.

RUBBERLITH—No. 189,634. Paul M. Marko, doing business as Marko Storage Battery Company, Brooklyn, New York. Storage-Battery Cases.

LIFELINE—No. 190,162—Ivory Garter Company, New Orleans, La. Elastic webbing.

MUSCLE—No. 190,164. Ivory Garter Company, New Orleans, La. Elastic webbing.

(Not subject to opposition.)

DUNLOP—No. 180,084. Dunlop Tire & Rubber Corporation of America, Buffalo, New York. Golf Balls.

MULTNOMAH—No. 180,141. Theo. Bergmann Shoe Mfg. Co., Portland, Oregon. Shoes of rubber, leather, fabric or combinations.

Wrapping Machine Suit Filed

The following notice of a suit appeared in the Feb. 12 issue of the *Official Gazette* of the U. S. Patent Office:

1,153,704, F. M. Pierce, Wrapping; 1,263,923, same, Tire-wrapping machine; 1,158,278, Pierce & Pierce, Wrapping machine; 1,432,034, P. Pierce, same; 1,238,318, T. Midgley, Paper-wrapping machines for tires, suit filed Jan. 2, 1924, D. C., Mass., Doc. E 1883, *Pierce Wrapping Machine Co.* v. *Terkelsen Machine Co.*

Statistics Compiled from 1923 Questionnaire—Fourth Quarter

COVERING THE LAST THREE MONTHS OF 1923

Number of rubber manufacturers reporting data 236
Number of crude rubber importers and dealers reporting data 46
Number of reclaimers (solely) reporting data 7

TOTAL DAILY AVERAGE NUMBER OF EMPLOYES
(On Basis of Third Week of December, 1923)
137,910

	Reported by Mfrs. who also reclaim (19)	Reported by Reclaimers solely (7)	Total
No. of Tons Reclaimed Rubber Produced from Raw and Crude Scrap	5,676	14,565	20,241
No. of Pounds of Scrap Rubber (including Raw and Cured Scrap) Consumed in production of Reclaimed Rubber	7,853	17,370	25,223

Number of Tons of Crude Rubber Consumed in the Manufacture of Rubber Products and Total Sales Value of Shipments of Manufactured Rubber Products

PRODUCT	Number of Tons of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries		
Automobile and motor truck pneumatic casings	31,947	$100,251,000
Automobile and motor truck pneumatic tubes	9,648	17,175,000
Motorcycle tires (casings and tubes)	69	346,000
Bicycle tires (single tubes, casings and tubes)	268	11,055,000
All pneumatic casings and tubes, not elsewhere specified	...	45,000
Solid tires for motor vehicles	2,379	6,345,000
All other solid tires	44	147,000
Tire sundries and repair materials	613	2,811,000
TOTAL—Tires and Tire Sundries	44,968	$128,175,000
Other Rubber Products:		
Mechanical rubber goods	2,880	16,560,000
Boots and shoes	4,349	32,241,000
Insulated wire and insulating compounds	704	8,683,000
Druggist sundries, medical and surgical rubber goods	557	3,107,000
Waterproof cloth, clothing, and rubber sheeting	698	6,211,000
Hard rubber goods	703	2,569,000
Heels and soles	1,053	4,401,000
Miscellaneous, not included in any of above items	1,343	4,705,000
TOTAL—Other Rubber Products	12,287	78,477,000
GRAND TOTAL—ALL PRODUCTS	57,255	$206,652,000

Inventory of Crude Rubber in the United States and Afloat for U. S. Ports, Dec. 31, 1923

ON HAND	Long Tons—Plantation	Para	All Other
Manufacturers	50,033	2,854	811
Importers and Dealers	17,951	1,030	241
Total	67,984	3,884	1,052

GRAND TOTAL—ON HAND, 72,920

AFLOAT	Long Tons—Plantation	Para	All Other
Manufacturers	7,555	20	—
Importers and Dealers	28,539	235	66
Total	36,094	305	66

GRAND TOTAL AFLOAT, 36,465

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